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Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

No. 245

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Melbourne THE AGE in English 14 Sep 82 pp 33,34

[Article by Don Maddocks]

[Excerpts]

By DON MADDOCKS

The David Syme group, publisher of 'The Age', may become an information provider on Australia's first national videotex network, Austel.

The company's research division, Syme Media Development, is conducting a feasibility study which could lead to a service being offered to private-user groups early next year.

The interactive communications system, which has been operating in Britain for three years, can be used for everything from checking flight information to real estate listings.

But its major application overseas has been a communications system for the travel industry, banking groups and companies dealing in the commodities market.

To date, Syme Media has been experimenting with several possible services, including travel and tourist information, real estate and employment listings, and remote purchasing.

Because the project is still in the experimental stages, Syme has taken a very low-key approach to marketing. Contact, so far, has been confined to working with companies interested in conducting joint trials.

"At the moment we're trying to perfect our database information structuring," said Mr Ian Gray, who heads the project.

He said that at the moment the experimental service, called Agetel-22, has a listing of more than 400 "pages" of information on the system which is jointly operated by Melbourne software house Computer Power and Control Data Australia.

The service was tagged Agetel-22 because 22 refers to the page number that has to be keyed in to access the Syme test project.

"Agetel is about the only service at the moment that has its database open to the public," said Mr Gray. But he added that the service was mainly being used for demonstrating purposes because very few people had their own terminals.

The number of experimental pages on the service was growing weekly as other companies who had joined the pilot study contributed information, said Mr Gray.

The information itself is stored on a computer at Control Data's new $18 million computer centre at Knoxfield.

This is linked to a multi-million dollar national communications network which could carry the two-way flow of information Australia-wide if needed.

The system is based on Aregon software developed from British Telecom's Prestel service.

Mr Gray said he was told that between 150 and 200 terminals were already linked to the Austel network in Melbourne and Sydney.

The Victorian Department of Agriculture is also an experimental information provider on the system.

It has a service for farmers, called, appropriately, Farmhand, which is designed to keep them up to date with information including the latest stock prices, news and weather.

Despite The Age's access to daily news, Agetel-22 is unlikely to be used as a new medium — at least for the foreseeable future.

Syme Media is taking two basic approaches to videotex: providing information itself, and structuring databases for large companies that lack the expertise.

"Some groups may be looking for a turn-key operation," said Mr Gray. "They may want a system to run within their own organisation, but don't want anything to do with putting the information up.

"We also see ourselves providing an umbrella for smaller groups who wouldn't want to go to the extent of being a major information provider themselves."

Obviously there are many ways the videotex market could develop in Australia, so most companies have tried to maintain a very flexible approach to the medium.

Apart from David Syme & Co Limited, a number of other groups have "tested the water". The Myer group, ICL Australia, Publishing and Broadcasting, and at an enthusiast level, The Australian Beginning, have all been in-

volved with videotex systems of one type or another.

Only The Australian Beginning is actively marketing its "utility" to the public, but this is mainly confined to microcomputer buffs at this stage.

The thing that seems to be holding most groups back at the moment is the fact that although videotex is an effective communications medium of great promise, no one is really sure how they can make money out of it.

The big problem stems from the 'Catch-22' that it isn't economical for information providers to create a service until the public have videotex terminals . . . and the public won't buy the terminals until they have something to access.

Like television in the early stages, it is all going to take time. But most media groups are keen to continue their independent research into the medium for fear of being caught out if the service snowballs.

Most groups that are serious about the new medium are trying to integrate video disc and videotex, to provide an interactive database that can supply both data and "live" video.

Syme's audio/visual production subsidiary, AAV-Australia, is working on the problem in conjunction with Ian Gray's research team.

Videotex's short-term success hangs largely on its acceptance as an effective communications medium by the business community.

Computerized Business Service

Melbourne THE AGE in English 14 Sep 82 p 33

[Text]

In a bid to diversify its operations, the big national retailing group, Myer, has launched a computerised information service for the business community.

The new service, called Infoquest, is part of the group's long-term plans to expand its operations in communications and information processing.

Using a network of more than 200 databases, Infoquest is designed to track down information that companies would normally find difficult, or time-consuming, to locate themselves.

Mr Brian Magill, general manager of the new service, said such a move was long overdue.

"Generally there is a low level of awareness of currently available information sources and facilities in Australia."

Ms Diana Killen, manager of Infoquest's information research and analysis service, said the move represented a significant milestone in the development of a commercial information industry in Australia.

"Business, industry and Governments need reliable information to solve problems and make decisions."

Ms Killen said that for companies to remain competitive today, they had to keep abreast of developments in information technology.

Infoquest is modelled on similar services in the US.

Ms Killen said better information led to better corporate decisions, but it was often time-consuming.

"Infoquest is designed to take the worry out of information search and retrieval by offering a range of information services, including factual data, statistics, reference lists and summary reports."

Ms Killen said that because most businesses needed information in a hurry, much of Infoquest's business would be done by telephone.

Infoquest has access to several databases, including Dialog in California, Dow Jones in New York, the European Space Agency in Italy, and I.P. Sharp in Canada.

These services are linked through the Overseas Telecommunications Commission's Midas network.

Unlike most videotex operators, Infoquest sees itself as an information searcher, not an information provider.

"What we're intending to do is to be the broker, the middle person between th client who needs information and all the existing information sources," said Ms Killen.

"Sometimes it's appropriate to access information in machine readable form. Sometimes it's appropriate to find it in printed form, and sometimes it only exists in somebody's head. So restricting yourself to accessing or establishing only one database, won't give you a spread of necessary resources."

Using Australian Consolidated Industries' Ausinet service alone, Infoquest will have access to ACI's files, which include the Australian Science Index, and those of the 'Australian Financial Review' and the Australian Business Review.'

Clients using either the Australian network or the overseas databases, will be billed monthly for the amount oft ime used to search for information.

Ms Killen said there would be an additional fee to cover OTC charges and the cost of preparing reports for clients, but this had worked well overseas.

"Communications and information is certainly a growth area," she said. "If one looks at similar operations in the United States, there are some 300 people whom — we could class as fee-based information services.

"These range from small, one-man consultancy operations, to others that employ as many as 50 people."

Initially, the Myer service was employing about half a dozen staff, she said.

Ms Killen said Infoquest would not be marketed to the public, because for about $50 an hour, there would be little demand

In the US, information services had seen "spectacular growth" since the mid-1970s, she said. In France, at least one service had operated since the mid-1940s.

"Most libraries charge for computer searches that they conduct," she said.

"The idea of providing information for a fee has been around for a long time, but it can also save people days, weeks, even months of going through the traditional sources."

CSO: 5500/7504

GOVERNMENT CONSIDERING EUROPEAN FIRM FOR SATELLITE LAUNCH

Melbourne THE AGE in English 11 Sep 82 p 5

[Article by Michael Gordon]

[Text] CANBERRA. — The Federal Government may choose the European company, Arianespace, to launch the national satellite in 1985, despite the failure of an Ariane satellite launcher in its first commercial flight yesterday.

The general manager of Aussat Pty Ltd, Mr Graham Gosewinckel, said last night the failure would not influence the decision of which agency would launch thesat ellite.

The Federal Government has paid $$200,000 to both Ariane space and the US space agency, NASA, to secure reservation bookings for the launch in mid-1985.

Aussat Pty Ltd, the company set up by the Government to own and run the satellite, is now in the process of finalising a recommendation to Cabinet on which agency to use. Cabinet is due to decide by November.

The Ariane L-5 rocket, which was launched from French Guiana, should have put two satellites into orbit on its first operational flight, a spokesman for the European Space Agency (ESA) said.

"It looks like a failure . . . apparently the satellites are not in orbit," he said.

A propulsion or a guidance guidance fault had affected the third stage of the rocket and all contact had been lost, he said, adding that ESA was not exactly sure what had happened.

Mr Gosewinckel last night described the Arianespace launcher as a "magnificent rocket system". He said: "It is very unfortunate for them for this to occur, but it's not unusual.

"I don't believe this is a total disaster as far as Aussat is concerned. All rocket systems have difficulties in their early days."

Although the cost of launching with two agencies have not been released, it is believed that NASA has quoted around $14 million for each launch while the Ariane space has quoted around $24 million.

The advantage of Ariane is that its launch is much closer to the equator, enabling the Australian satellites to reach their required geostation with less fuel, thus extending the life of the satellites by about two years.

Both the Ariane and NASA space shuttel have had teething problems. One Ariane rocket exploded in mid-air shortly after its second trial launch in May 1980.

Earlier this year, the president director-general of Arianespace, Mr Frederick d'Allest said the company had contracts for 32 satellites and a further 11 reservations. He said a marketing survey had estimated there would be 180 satellites compatible with Arianespace in the Western world between 1985 and 1991.

The Federal Government announced its approval of the national satellite system in May. The former Minister for Communications, Mr Sinclair, put the total cost of the system at about $650 million.

CSO: 5500/7504

DETAILS OF DOMESTIC SATELLITE OPERATIONS DISCUSSED

Canberra THE AUSTRALIAN in English 14 Sep 82 p 22

[Article by Alan Harlow and Ian Parkin]

[Excerpts]

IN 1985 Australia's own domestic satellite, Aussat, will allow high capacity, long-haul communications nationwide and with an immediacy only found previously within a single city.

Recognition of the anticipated demand for communications satellites is evident in that nations are now considering sections of the geostationary orbit as a scarce national resource over which they have rights in law.

One way to increase orbit capacity would be to place more satellites in the critical orbit, operating at different non-interfering radio frequencies.

But the range of frequencies which are suitable and which will not interfere with ground-based communications is itself limited.

Currently, only two frequency bands of 4-6 and 12-14 gigahertz (one gigahertz is 1000 million cycles per second) have been allocated for satellites.

It is intended that Australian satellites will operate in the higher of these bands.

Fortunately, however, the pressure on orbit space is now motivating research into the use of still higher frequency bands.

A satellite must relay downwards, or repeat, any signal it hears within its frequency range.

It must also keep reception distinct from transmission — it must not receive its own transmissions.

To ensure this, the uplink signal is shifted, or "translated", by a fixed amount to form a different frequency downlink signal by a device known as a transponder.

Each transponder can handle about 1000 voice channels, or one television channel, or data in the range of millions of characters per second.

Australian satellites will carry 15 transponders (four with 30 watts and 11 with 12 watts output) all working in various frequency ranges within the overall allocated frequency band.

On the drawing boards there are designs for satellites which will steer electronically very narrow radio beams for short period interconnection of small ground sites.

This will be particularly suitable for point-to-point two-way data communications, in which the satellite will act as a "switchboard in the sky".

Their use will reduce the size and cost of dishes and ultimately benefit the smaller user.

In the meantime, technology requires that the traffic of the numerous private business users is fed via land-lines and switched through large centralised ground stations.

Eight such major city ground stations are planned as an integral part of the Aussat project.

It is unlikely that many commercial users in Australia will justify the continuous use of one of the 15 Aussat channels/transponders.

Consequently, most business communications will be mixed or multiplexed.

In the US, management companies of large transponder capacities are emerging as business ventures.

A management company leases a whole channel and then sub-leases some of its capacity to a number of shareholders or customers.

In Australia three forms of management are likely to emerge.

First, there will be the large public-sector agencies, such as the ABC, exclusively utilising a channel.

Second, as an interim measure, Aussat Pty Ltd will be the sole operator of the eight major city ground stations with "tails" to end-user premises.

And, ultimately, other management companies may represent groups of commercial users.

Users that will benefit most from satellite communications will be those who have either large parcels of traffic for rapid long-haul transfer or a commitment to service remote regions of Australia.

Traffic

Television, radio, telephony, maritime services are all potentially high usage areas.

Next could be organisations such as banks, airlines and those companies which see a competitive advantage, even at an increased cost, from such responsive communications.

For other businesses it is difficult to see, at least in the short term, how they will have a sufficient volume of traffic to cost-justify satellite usage in preference to land-based communications services such as digital data and packet networks.

But commercial pressures may in the longer term significantly change the nature of traffic to be carried.

It is clear that as Australian business adapts to our first-generation satellite, it should keep one watchful eye on opportunities to exploit this modern tool and the other on the second-generation technology already on the drawing board.

**Mr Harlow is managing director of Disc International, Dr Parkin is with the Basser Department of Computer Science at Sydney University.*

CSO: 5500/7504

SATELLITES WILL SPREAD VHF COMMUNICATIONS NATIONWIDE

Canberra THE AUSTRALIAN in English 1 Sep 82 p 14

[Text]

SATELLITE communications will bring near-universal direct high-quality VHF communications to aviation throughout Australia, according to the Department of Aviation.

The existing HF system will be held in reserve as a backup.

The Federal Government announced last week that it would proceed with the aviation segment of the Australian national communications satellite system at a cost of $30.9 million over the next six years.

The Minister for Aviation, Mr Fife, said the Department of Aviation proposed to use the satellite system from the start of its commercial operation in 1986.

Most direct communications between pilots and air traffic controllers are on the very high frequency (VHF) band, which provides good quality and high reliability.

This is not true of routes traversing sparsely populated areas, where the high frequency (HF) band must be used.

HF has well-known limitations of poor intelligibility, propagation vagaries, inability to provide direct pilot-controller working, and limited traffic capacity.

Heavy reliance must also be made on HF and on telephone lines of indifferent reliability for communications among controllers (ATC and flight service) and for transmission of teleprinter messages, meteorological information, etc.

Satellites will provide the necessary link to permit direct VHF communications at any point in Australia at a cost quite independent of distance.

VHF outlets will be established even at extremely remote locations, if required to serve overflying routes, as well as at terminal areas or even for emergency or short-term needs.

Satellite terminals at manned locations will provide instant access to any location desired with high quality and reliability for all voice and data needs, according to the department.

Continuity

A satellite system used in this way will allow the HF system to be held at its present level as a back-up system. It will also largely replace the existing microwave-link system.

To make maximum use of the satellite system, the department plans to install satellite ground stations at more than 100 locations by 1988. The satellite system is expected to become operational in 1986.

Duplicate facilities will be installed at each location, each half operating through a different satellite to ensure complete continuity of service.

In all, installations are planned at 48 manned locations and at 53 remote locations, where VHF air-ground outlets will also be installed.

Two transponders will be used continuously in each of the two operating satellites.

Each satellite has a total of 15 transponders, so the Department of Aviation requirements account for close to one-seventh of the total capacity of the satellite system.

Satellites will enable improvements in the quality and coverage of communications between aircraft and air traffic control and flight service units around Australia, particularly in remote areas.

About 100 satellite ground sta-

tions will be required.

The system will provide a comprehensive network of point-to-point satellite links between air traffic service centres, and from those centres to a number of remote air-ground communication outlets throughout Australia, to carry voice and data traffic for aeronautical safety purposes.

The network will employ duplicate facilities that will operate continuously and independently through two satellites.

The system will enable air traffic service centres to choose the better of two independent signals from satellites in different geostationary orbits.

This will ensure continuous communications safety and integrity in the event of atmospheric or weather interference or where one satellite or its ground equipment fails, according to Mr Fife.

He said the satellite system would fully meet foreseen aviation communications requirements at a lower cost than the existing ground-based alternative.

The Department of Aviation will be one of the biggest users of the new satellite.

CSO: 5500/7502

COMPUTER INDUSTRY LEADER SEES COUNTRY LAGGING IN TECHNOLOGY

Canberra THE AUSTRALIAN in English 31 Aug 82 p 27

[Article by Peter Dwyer]

[Text] DOWN and nearly out computer manufacturer, David Hartley, could be said to have made his defiant last stand in Hobart last week.

Even the preparation of his keynote address to the Ninth Australian Computer Conference was not completed until the final hours before its presentation.

Mr Hartley was adjusting his speech from hourly reports on the present state of his company, Hartley Computer Applications, put into receivership in May by the Queensland Government.

He wanted to be accurate to the last minute.

Mr Hartley has been the talking point of the computer industry and this might be his last chance in Australia to speak his mind on what he saw as the problems besetting that industry.

He was about to savage Australians and their Governments for fearing technological change which condemned the young to a poor and mediocre country.

The same fear, he said later, would probably force him to leave Australia when the affairs of his company were cleared up.

"There is really no incentive for someone like me to stay here," he said.

Mr Hartley said the one thing Australians could influence decisively about technological change in the country was the extent to which it became self-reliant.

"Will we be dragged hesitatingly into the micro-electronics era by the forces of international competition while our economy lags, or will we embrace the opportunities and pursue them with a native technology industry?" he asked.

"I am very much afraid it will be the former.

"The national characteristic seems to be to want to cut down the tall poppies and stay stuck with our archaic mercantilistic philosophy that will never let us capitalise on fast-moving technological opportunities.

"I believe that the fundamental reason for this Australian failure is one of philosophy — our worship of mediocrity with its associated colonial mentality that the recent burst of nationalism has done nothing to change in substance."

Mr Hartley sees the demise of his company as the classic example of the effects of this attitude and he outlined why to 650 captive listeners at the University Centre in Hobart after the opening of last week's conference.

He told them a Hartley Computer chip design which would have replaced about 12 imported chips and given an improved performance was a victim of the receivership.

"We have been able to develop a combined hardware-software product that captured 50 per cent of the professional accountants' market in the United Kingdom.

"It is thought of so highly by our main competitor, a public company, it has bought our UK subsidiary and entered into an agreement to sell our product — rather a remarkable achievement for a company in receivership."

Mr Hartley said he was convinced there was a market for Australian-produced technology.

Australians were spending $2000 million a year on hardware and software services and there were excellent export opportunities.

Strife

He also dismissed the argument that an Australian native technology industry should concentrate on software.

He said it had been argued his company would not be in its present strife had it stayed a software house.

"While this is perhaps true, I refuse to accept that this is how it should be.

"I believe the real opportunity for Australia lies in special-purpose, relatively low volume products.

"For example, Hartley is still the only company in the world providing an international system for the accountancy profession.

"I believe it is crucial for product identification and so that development can be capitalised on for the particular needs of the market addressed, that the supplier control the total market — both hardware and software."

Mr Hartley criticised Australian financial institutions for being frightened by an industry they did not understand.

His company was forced to develop to sales of $15 million from capital of only $43,000 and he said this was typical in Australia because finance companies put no value on technology.

He said: "In our own case we believe that our own technology would have been valued at about $40 million in Japan, but here the value is zero.

"In current-day Australia it is not possible for small high technology private companies to grow adequately to provide employment and exports without resorting to tax avoidance."

Mr Hartley said the computer industry was affected as much as any other by industrial disputes and said last week's general strike in Queensland would probably disrupt the shipment of his company's systems to the new owner in the UK.

Having given the reasons he believed his company was in receivership, David Hartley proceeded to outline what had happened to prompt the Queensland Government's actions, which he argued were premature.

He said the company lost $750,000 in credit when an American supplier perceived Hartley's 3900 series as a threat.

A list of other problems involving suppliers, unions and banks forced the company to seek a $1.7 million guarantee from the Queensland Government in August, 1980.

The guarantee came through, but not until early 1981, and even with private backing of $1.7 million was "too little too late".

Expected sales of the 3900 were not fully achieved and by late last year the company was forced to retrench staff.

By May this year a further product in the 3900 range looked like pulling the company out of trouble.

After discussions with the bank concerned, Hartley missed a principal payment on the Government-guaranteed loan, but paid the interest expecting to make up the shortfall in July.

Warning

But the Government moved in on May 28, according to Mr Hartley, without warning or discussion, and put the company into receivership.

He said: "By September the Queensland Government guarantee loan would have been paid out. Instead the company is up for tender.

"Can you imagine that happening in Singapore?"

A bitter Mr Hartley had earlier said countries such as Singapore and Hong Kong were racing past Australia in developing technology industries, just as he believed they had as the centres of banking in the region.

He warned that Australia was in danger of becoming the "great white trash of the South Pacific".

It needed to urgently revolutionise its taxation system, adopt a national approach to developing a high technology industry, reduce the number of trade unions, expand education and retraining schemes and be prepared to let some industries die in return for growth elsewhere.

"Am I hopeful that even some of this will happen?," he said, "Not really."

CSO: 5500/7502

TELECOM DIGITAL NETWORK WINS INTERNATIONAL PLAUDITS

Canberra THE AUSTRALIAN in English 30 Aug 82 p 12

[Article by Vincent Blake]

[Text] TELECOM's standing in the international telecommunications arena has been given a significant boost with the acceptance of its technique to maximise the performance of digital networks.

Work done by Telecom's research laboratories gained international recognition by being accepted by the International Telegraph and Telephone Consultative Committee (CCITT) as a standard.

The Telecom team was pitching itself against the world's biggest company, AT and T, which has been working on the problem through its subsidiary Bell Telephone Laboratories.

Such a victory means without doubt that Australia has the expertise to work on the cutting edge of technology.

What Telecom engineers found is a way of measuring the performance of any particular repeater in a digital telecommunications network.

The technique determines a specification called the Crosstalk Noise Figure for a particular repeater.

Telecom, like most other national carriers, is in the process of converting the old analog system over to a digital system.

Digital systems use pulse code modulation (PCM) for transmitting information.

This information can be anything from the human voice to high speed computer communications or television transmission.

It can travel on wires, cables, radio, microwave systems and even light impulse systems.

Digital transmission allows up to 30 voices to be carried on a pair wire — the standard telephone conduit.

These systems require repeaters to re-transmit the signals about every 2km along the cable.

The precise placing of the repeaters in the system cam be determined more accurately if the ammount of crosstalk between the PCM system on different pairs of wires in the same cable can be determined.

Actual limits of the digital transmission system depend both on the crosstalk characteristics of the cable and on the sensitivity of the digital repeaters to this type of interference.

The Crosstalk Noise Figure (CNF) assesses the sensitivity of a repeater to crosstalk interference.

It can be measured readily for each repeater and then used directly by Telecom network designers to establish the maximum distance between repeaters and the number of PCM systems that can be installed on a given cable.

The technique to make this measurment was invented by Dr Alan Gibbs of Telecom's research laboratories.

Patents are being sought.

The practicability of the CNF has been widely recognised arround the world.

A special CCITT committee meeting in Geneva adopted the specifications of Telecom's system, giving the process international acceptance.

Prior to the adoption of the specification, engineers of the Bell Telephone Laboratories in the US had undertaken their own investigation to measure CNF performance.

During those investigations, they lent several digital repeaters to Telecom as a part of a joint program.

Australian industry was also involved.

A Melbourne company, Jacobs Radio (Aust) Pty Ltd, is working on a prototype of the instrument.

This work is being carried out under Telecom's industrial research and development contract program.

CSO: 5500/7502

SCIENTISTS URGE NEW APPROACH TO INTRODUCTION OF TECHNOLOGY

Canberra THE AUSTRALIAN in English 31 Aug 82 p 20

[Article by Nicholas Rothwell]

[Text]

TWO of Australia's leading philosophers of science have laid down basic rules for the introduction of information technology.

Their comments made an important contribution to the Department of Science and Technology's Information Technology Week survey on the potential of new computer systems.

Professor Ron Johnston and Dr Jim Falk, both of the Department of History and Philosophy of Science at Wollongong University, warn there are serious flaws in the introduction of new technology in Australia.

They stress that the effectiveness — indeed, the entire effect — of a technology is largely determined by the manner of its introduction.

Technology "does not exist in isolation" but is created for a particular context, so that the effectiveness of a computer is dependent on its users.

Their paper suggests the introduction of computers has, until now, tended to boost the absolute control by management over production processes, even though the natural result of phase-in of new technologies will be to create an even more serious need for more "organic" and decentralised operations.

"Within a traditional authoritarian structure the benefits of the technology are likely to be largely negated, and a great deal of strain is likely to emerge in such organisations," they predict.

They indicate that a reworking of conventional management techniques has given a radical force to the "transforming potential of information technology" and has major implications for corporate structures.

But they caution that a computerised information system requires absolute precision in such matters as coding structures, system specification and operating procedures, and that the background has to be specifically recognised and extracted into a form suitable for incorporation into programs.

Management is required by such technologies to engage in a form of radical "future-tense decision-making", in which events have to be conceived of and dealt with before they have happened.

Strategies

In such situations, according to Professor Johnston and Dr Falk, the "hierarchical model of an organisation is entirely inappropriate", and to assume that senior management alone has the information to perceive future events and needs is dismissed as inviting certain error and "possibly disaster".

Their paper also warns against lending information systems an authority "far beyond their due" and suggests computers cannot currently detect changes in the working environment beyond those conceived of at the time of design.

"Modern information technology creates a need for management to rethink the assumptions upon which its present methods of operation are founded — equally the new microelectronics technology challenges the basis on which the workforce, and more broadly the community, build their activities."

And the authors stress that the cheap or free provision of information — possibly by the state — in highly accessible form is rendered perfectly feasible by the latest advances.

The paper indicates the possibility of the formation of an "information utility" and emphasises the need to consider public concerns over such issues as privacy, the developent of new forms of electronics-based "democratic processes" and the effects of new systems on employment, productivity and skill levels.

Professor Johnston and Dr Falk point out that Australian trade union concerns over new technology may be mounting as fears over the future implications for work and the community develop.

They suggest a general increase in community pressures for a say in the shaping of major new technologies is likely, and that broad concern focuses on the applications of microelectronics that most facilitate public participation in "the relevant decisions".

The best technique identified to assess and accommodate community concerns is to create planning processes that allow and encourage more public involvement.

The paper suggests that public concerns and the need for improved efficiency converge in the requirement for the development by government and business of strategies for general consultation, rather than "some damaging, and perhaps not too distant, conflict".

CSO: 5500/7502

AUTOMATIC HOPPER-FED CARD READER DEVELOPED IN VICTORIA

Canberra THE AUSTRALIAN in English 31 Aug 82 p 25

[Text] AN Australian electronics company says it has responded to the cries of the single terminal computer owner by releasing an automatic hopper-fed card reader.

The reader, the Dyad Lance, has been designed and built by Professional Australian Systems (PAS), of Thornbury, Victoria, and is an upgrade of the reader originally incorporated in the Dyad Dragon microcomputer released last year.

PAS sees the product as overcoming the shortcomings of imported units and providing a means of easy access for multiple users to a single keyboard computer system.

"Imported one-card-at-a-time units have been rejected locally for their unreliability," said PAS managing director, Mr Neil McKellar.

"Hopper-fed units have been priced beyond reach for smaller micro and minicomputer installations.

"Unlike other readers, the Lance has an internal microprocessor, which allows it to communicate via RS232 I/O ports with a wide range of different computers.

"The Lance overcomes time wasted in rewriting data and program material prepared away from the computer keyboard, and eliminates keyboard bottlenecks caused by untrained operators and those with low or non-existent typing skills.

"It has been designed to help schools maximise the use of their computing equipment with minimum capital outlay," Mr McKellar said.

By using the Lance and its hopper-feed facility, over 120 lines of data could be entered every two minutes, giving a 100 to one advange over straight keyboard entry.

The standard unit accepted Basic, Pascal and data cards, and could be programmed for other cards on request, he said.

There was an optical timing mark version which accepted cards of the Hewlett-Packard type.

"Students, teachers and administrators may compile their data remotely and, by using the hopper-feed facility on the Lance, batch run them quickly without tying up the system.

"For computer appreciation and computer science groups, students may prepare their programs as homework and have them tested in minutes, rather than hours, during class."

In the staffroom, the teacher marking test papers could quickly prepare results cards ready to add to the faculty database or for the end-of-term school reports.

CSO: 5500/7503

BRIEFS

COMPUTER DATA SCRAMBLING--QUEENSLAND computer designer and manufacturer, Era Computer Corp (Eracom), has launched what it claims as a world first in data security for the small computer. In Brisbane the company unveiled its ERA-230 data encryption module and its ERA-60 small computer which includes the encryption unit. Eracom group president, Dr Bill Caelli, said the ERA-230 was a hardware module for use in IEEE-796 bus based computers. "It actually scrambles all data input. You might compare it to telephone scrambling," he said. "Even if you are able to tap the scrambled telephone line, the conversation would be completely unintelligible. Our ERA-230 encryption board does the same thing with all data while it is being entered, while it is in memory and it is permanently stored on discs, and while it is being transmitted across communication lines." He said the traditional approach to data security had been at the software level through the use of passwords. "The ERA-230 module breaks with that tradition because with the module in place, even access to the password is not the key to access the data." Turning to the ERA-60, he said this was a small, multi-user computer with 512K bytes of main memory. A major feature was the inclusion of the data encryption facilities that enabled program and data files to be made secure. [Canberra THE AUSTRALIAN in English 31 Aug 82 p 26]

INFORMATION TRANSFER SERVICE--MYER Communications Pty Ltd, a subsidiary of The Myer Emporium, has launched an information transfer service for Australian industry. Called Infoquest, the service is part of Myer's long-range plan to diversify into communications and information processing. It makes available a wide range of data from local and overseas sources, including over 200 computerised databases. Manager of Infoquest's information research and analysis service, Ms Diana Killen, said: "Infoquest is designed to take the worry out of information search and retrieval by offering a range of information services. These include factual data, statistics, reference lists, summary reports, etc." She said because business people needed information in a hurry, much of Infoquest's business would be telephone based. Customers anywhere in Australia could call Infoquest's Melbourne office for the cost of a local call. Databases accessible by the service included Dialog in California, Dow Jones in New York, the European Space Agency in Italy and IP Sharp in Canada. Ms Killen said Infoquest also had access to Australian databases through the Ausinet information network operated by ACI. [Canberra THE AUSTRALIAN in English 31 Aug 82 p 26]

DARWIN TV BOOST--DARWIN'S only commercial television serivce, Channel 8, began to use improved broadcasting facilities at the weekend--almost eight years after cyclone Tracy destroyed its old studio. The Minister for Communications, Mr Brown, opened $2 million worth of extensions to the station's complex which will improve the broadcasting quality of Channel 8 programs. Mr Brown said the future for radio and television in Darwin was bright because of the rapid growth of its population and economy. Broadcasting problems were being ironed out, he said. [Canberra THE AUSTRALIAN in English 30 Aug 82 p 2]

CSO: 5500/7503

OFFICIAL WRITES ON BANGLADESH TELEPHONE SYSTEM

Dacca THE NEW NATION in English 28 Sep 82 p 5

[Article by Kazi Abdur Rouf]

[Text]

The Telephone Shilpa Sangstha Limited (TSS), a joint venture of the Government of Bangladesh and M/S Siemens AG of Federal Republic of Germany, is making a great stride for boosting the economy of Bangladesh. The plant, set up at an initial cost of Tk. 3.3 crore at Tongi Industrial Area in 1967, went into production in 1970.

TSS being the only industry of its kind in Bangladesh manufactures telecommunication equipments to cater to the need of the country. It is also capable of exporting telecommunication equipment outside the country after meeting the domestic requirements.

The Telephone Shilpa Sangstha has an installed capacity of producing 16,000 line units of switching equipments including 100+100 circuits of STD epuipment, 100 sets of 2÷10 PABX, 25 sets of 5÷25 PABX and 54.000 desk telephone sets annually working in one shift.

In 1981-82, TSS manufactured exchange equipments of 11,500 line units and 17,800 telephone sets which met the entire domestic requirements for the year. It experienced manifold problems during the post-liberation period. Since 1975 the pace of production has been accelerated and in 1977-78 the TSS manufactured exchange equipments of 16,000 line units and 24,000 telephone sets which is its rated capacity.

Since liberation, TSS has put into operation 85,000 line units of automatic exchanges at 32 cities and towns of the country. It is worthwhile to mention here that 18 new towns have been provided with automatic telephone system by TSS so far.

In a span of 10 years TSS has been able to raise the telephone exchange capacity by about three times increasing it from the liberation 49,000 lines to 1,34,000 lines now in operation in the country. Similarly, STD circuits have now been raised to 250+250 from pre-liberation 70+70 circuits.

Contrary to the popular belief, TSS is not only an assembly plant, rather it fabricates most of the parts required. About, 3,000 parts for Telephone Exchange system of all sizes are now being manufactured at TSS. The products include subscriber's line circuit, line finders, first, second, third and fourth group selectors, service and trunk group selectors, final selectors, test group selectors, incoming and outgoing

junction repeaters, local group and subscribers trunk group selectors, service repeaters, exchange signalling equipment, EMD motor switches, call meters, test board, enquiry and complaint desk, telephone set, stenophones, PABXs and STD equipments.

With the objective to increase the production depth and to expand the production spectrum of the TSS, a project has been taken up for a total of Tk. 6.74 crore. TSS has received a grant equivalent to Tk. 2 crore 47 lacs from the Government of Federal Republic of Germany for the procurement of machinery and equipment for the project.

Apart from production, the Planning and Installation wing of TSS plan and design all sizes of public telephone exchanges and STD systems and install the exchange equipment on turn-key basis all over the country as per specifications of the T&T Board.

TSS has received an order for supplying telephone exchange equipments worth Tk. 1.0 million to the Federal Republic of Germany. Shipment of goods in different lots has already been made and delivery of the rest amount is expected to be completed soon. Besides, TSS had supplied one model telephone exchange to International Telecommunication Union (ITU). The quality of the products of TSS has also been duly appreciated by ITU authorities.

Under an agreement between Government of Bangladesh and Federal Republic of Germany, Siemens experts are assisting TSS. Besides, engineers and technicians are being trained in Siemens' factories in West Germany. Since 1973 Siemens experts, for a total of 30 man-years in various field of planning, production and installation have been working in TSS. The number of Siemens experts have been gradually decreased with the progress in self-reliance from initial 9 to present 4 experts.

TSS is examining the possibility of switching over from the conventional Electromechanical Switching System to Electronic Digital Switching System. Accordingly, a research and development division has been established with the aim of acquiring self-sufficiency in technological know-how in the field of modern telecommunication.

CSO: 5500/7013

INACTIVITY OF RADIO BANGLADESH COMMITTEE REPORTED

Dacca THE NEW NATION in English 19 Sep 82 pp 1, 8

[Text] The standing committee comprising members of the intelligentsia looking and charged with into the performance and standard of the programmes put on air by the national broadcasting house—Radio Bangladesh—seems to be non-existent as it did not hold a meeting for years together.

The committee headed by the Secretary of the Information and Broadcasting Ministry had its last meeting soon after it was formed in early 1979.

The standing committee that included educationists, scholars, renowned artistes, members of now defunct Parliament etc. was due to meet every month to review the various programmes put on air by Radio Bangladesh with emphasis on suggesting ways for overall growth and development of the national radio.

According to knowledgeable sources, the committee earlier known as advisory committee during the Pakistan days could not hold its meeting because of too much bureaucratic in the affairs of the national radio.

The sources said the standard of performance and the quality of various programmes of Radio Bangladesh phlumetted to the present deplorable stage largely because of the non-existence of the committee which was supposed to watch-dog the totality of the radio's performance.

CSO: 5500/7005

PROBLEMS OF CHITTAGONG TELEPHONE SERVICE NOTED

Dacca THE BANGLADESH OBSERVER in English 18 Sep 82 p 1

[Text] CHITTAGONG Sept. 17:—The telephones in Chittagong hardly offer the desired services to the subscribers. The 18,000 telephones of the port city are subject to frequent faults.

Dial tone comes and goes in many telephones in a whimsical manner. Dialling a number is often responded to be silence from the other end. If any persevering subscriber wants to push his luck further by trying to get the number more than once his telephone may go dead. Besides cases of cross connections wrong numbers and false rings are increasing.

According to Chittagong telecommunication region there are four telephone exchanges in Chittagong city. These are central exchange with 15,000 lines Baizid Bostami exchange with 2,000 lines Agrabad exchange with 5000 lines and Sagorika exchange with 7,000 lines.

Of the four telephone exchanges the central exchange originally having the capacity of 10,000 telephone lines was set up in 1952. This exchange was added with 5,000 more lines last year to meet the increasing demand of telephones. The other three exchanges were also set up in recent years to cop with the demand of the telephone subscribers of this bulging port city.

The increase in exchange has not contributed much to the improvement of telephone services. The subscribers always find their phones in bad shape.

The subscribers having connection from obsolete central exchange are "worst" sufferers. This exchange picked up a wide range of faults. The telephone staff had to put in their best to keep this exchange functioning.

Faults should be attended to within six hours of complaints made by the subscriber. If the line is not restored within the specified period, he can get in touch with the Sub-divisional Engineer. If the SDE fails to take action within 24 hours, the Divisional Engineer should be informed. But the experience of the subscribers is that every time they contact the exchange, a fault docket has to be given.

Similarly, the teleprinter service in Chittagong city breakdown every now and then and remains out of order at times for days together.

The Chittagong telephone authority blame the indiscriminate digging and theft of underground cables for the frequent breakdowns. The authority claimed that the unskelled labourers who have no knowledge of underground telephone cable usually do the digging for the civic authorities resulting in large faults.

Theft of cables is said to be another reason for the breakdown of telephones. Heavy rainfall also disrupt the telephone lines and create faults in cables.

CSO: 5500/7004

U.S. SCIENTISTS RESPONSIBLE FOR INSAT-1A FAILURE

New Delhi PATRIOT in English 8 Sep 82 p 2

[Editorial]

[Text]

EVEN before it was launched from the Cape Canaveral rocket base in the US, INSAT-1A had developed a snag in the solar sail which had to be replaced. The death in space of this geostationary satellite is a major setback to the country's telecommunication system. Pending an authoritative statement on this grave failure, it is not right to speculate on the causes of this serious unsettlement in the space programme. A space vehicle which should have had a normal life span of seven years appears to have lasted no more than five months. How INSAT-1A has run out of fuel—this has been given in some reports as causing the failure—must be probed by a competent investigative agency. INSAT-1A was not an experimental venture: it had been worked into the country's telecommunication network and was an inseparable part of the expansion programme of the system which is so run down and inefficiently managed that a collapse of the network appears to be imminent now that no relief is to be expected from this geostationary satellite.

What is at stake is not the ambitious expansion plan of television, about whose importance at a given point of time there may well be two opinions. The programme content of Doordarshan is abysmally of poor quality. What is devised as the programme for rural audiences is more often than not thinly disguised poor quality urban entertainment or endless song-and-dance clips from dreadful feature films. Few will miss anything and even less will complain if the so-called national TV programmes—which are anything but national—cannot be carried into rural homes. For the time being these can be shown to urban audiences for which they

are devised anyway. There is much bogus euphoria about colour TV and the importance of television in rural development. In any case AIR and Doordarshan, as structured now, cannot conceptualise the tasks of rural development entrusted to them. These two Government departments are so highly bureaucratised and unprofessional that they remain incompetent electronic media. It is an open question whether any major investment in these two services is going to make any contribution to expansion of information, education and entertainment. No, the setback to Doordarshan is the least of worries arising from the failure of INSAT-1A. There is a direct correlation between the efficiency of a country's communication network and its economic progress. The collapse of INSAT-1A will immediately aggravate the chaos in India's telecommunication. Besides the Asiad in November this year, the country is to host two major international conferences — of the Commonwealth and nonaligned heads of government — in the next few months. Whether safe and alternative arrangements can be made to meet the demands these international meetings are going to make on the telecommunication network remains to be seen.

INSAT-1A was not an indigenous vehicle. It was built at great expense by America's Ford Aerospace Corporation. It was boosted into space by American scientists. Clearly, if there are defects in the construction of the vehicle the inexperience of India's scientists, engineers and technicians cannot be blamed for them. Since Aryabhata was put in space in 1975 from a Soviet cosmodrome, India has come a long way. But the destruction of Rohini II, the delay in devising a reliable Indian launch vehicle, the absence of dependable propellant fuel and the latest disaster of INSAT-1A show the distance this country must still cover in this programme.

CSO: 5500/7237

HYPOTHESES ON SATELLITE FAILURE EXPLAINED

Bombay THE TIMES OF INDIA in English 26 Sep 82 pp 1, 9

[Article by Praful Bidwai]

[Text] Bangalore, September 25--The moon, or rather, a unique moon-earth INSAT-1A configuration obtaining sometime between 1 p.m. and 2 p.m. on September 4, might have caused a disorientation of the multipurpose satellite and the loss of its "attitude" (fixed position vis-a-vis the earth), which began the long process leading to its abandonment two days later. The improbable-sounding hypothesis discounted only ten days ago as "moonshine" by some Indian Space Research Organisation (ISRO) scientists is now gaining respectability among them. It is one of several hypotheses advanced to explain the loss of attitude, one of the three major multiple failures that occurred on September 4.

The proponents of the moon-configuration hypothesis base their reasoning on the fact that at 1346 hours (IST) on that day an abnormal drift was observed at the Master Control Facility at Hassan in INSAT-IA's earth sensor pitch data.

The satellite could have lost its attitude or earth look--a not-so-rare phenomenon in the international experience of satellites--because of the failure of its sensors to distinguish between the earth and the moon.

This "confusion" between the two celestial bodies could have been caused, argue the proponents of this view, at a unique moment of time, when the moon was behind the earth and just moving into the satellite's vision. If the moon disc was in the specific region which the INSAT-IA sensors scan, then the satellite might have been confused by it and thus lost its normal earth attitude. The sensors "see" the infra-red radiation from the earth and identify the planet only on that basis. Hence, on this view, the peculiar interference by the moon during a unique conjuncture is the main cause of the satellite's confusion and loss of attitude.

This view is now being critically examined in particular, checked with astronomical charts (ephemeris).

It is one of a group of hypotheses that attribute the loss of INSAT-IA's attitude to extraneous interference. Among others in this category are the hypothesis that some debris from space caused a "glint" in the satellite's "eye" (sensors) and another that a piece of cable or some other component of the satellite which might have come apart and into the view of the sensors was responsible for their confusion. The likelihood of any of these phenomena occurring is not high but ISRO scientists are loathe to dismiss any of them.

The other group of hypotheses are what may be termed "internationalist." These hold that the causes of the loss of attitude were purely internal to the satellites: either something went wrong with the electronics of the sensors, or the sensor hardware itself failed for some other reason.

"Even this is unlikely", a senior ISRO scientist told this correspondent. "The sensors were made by Lockheed. They have been used on more than 50 other satellites, including, INTELSAT V. And they have never failed. But then we can't rule out their failure. Everything is unlikely. But that doesn't mean it's not possible."

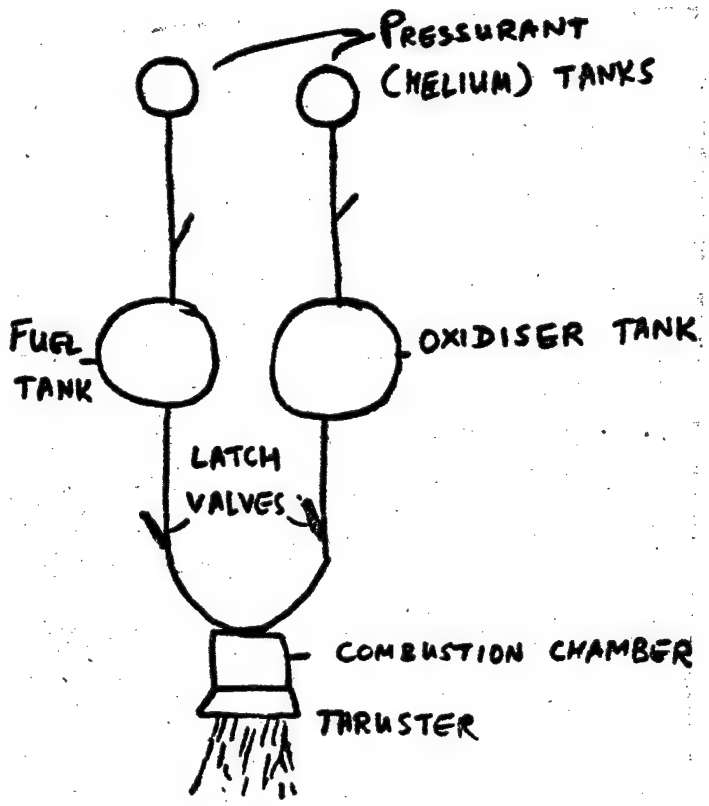
Similarly, the hypotheses advanced to explain the other two failures — of high-power telemetry and of a valve on the oxidiser supply line to the thrusters — appear unlikely at first sight. Nevertheless they are being examined in depth.

The high-power telemetry was activated at 1356 hours, after the sensors data abnormally was noticed and the satellite was put into what is called the contingency mode. At this time, the ground command power level was raised to three kW., against the normal level of less than one kW.

The high-power telemetry sends strong-intensity signals to the earth which carry data on several dozen parameters (in the normal mode, over 1000 parameters are monitored at short intervals). The data is vital to the earth-based command operation, which follows well laid-down procedures to carry over various manoeuvres to stabilise the satellite.

However, when the high-power telemetry was commanded, it did not come on. For the next four hours and 19 minutes, i.e. until 1815 hours, the telemetry did not work, except in short bursts, every 15 to 20 minutes. Thus in this entire crucial period, the satellite was in the 'blind mode', and ground command operators were unable to monitor its parameters continuously, as was necessary.

The reasons for the failure of the telemetry remain obscure. It may be due to the failure of switches which are meant to turn i ton. Or it might have been caused by other defects in hardware or the rest of the circuiting. Elaborate hypotheses have been advanced to explain these in terms of design defects or manufacturing faults.



A simplified schematic diagram showing the position of the latch valves that are suspected to have malfunctioned in the INSAT-1A power pack (thrusters).

In the case of the latch valves, the problems of isolating the causes of failure are equally difficult. At 144 hours, 10 minutes after the load - shedding operation (switching off all functions not strictly necessary for the emergency manoeuvres), the thruster configuration was initiated as per the laid-down procedure.

At 1450 hours, the attitude and orbit control electronics system was turned on to get the spacecraft into the sun-acquisition mode. With this, both the oxidiser and fuel latch valves should have opened simultaneously and instantly. However, shortly after 1500 hours, when a patchy burst of telemetry was received, it showed that the oxidiser latch valve was closed.

What this would imply is that the fuel (monomethy hydrazine) was flowing into th ecombustion chamber but not the oxidiser (nitrogen tetroxide). The fuel cannot turn without the oxidiser. It is so designed that combustion takes place only when it comes into contact with nitrogen tetroxide. Hence the fuel leaked out, producing no thrust.

Between 9 and 9.30 p.m. on that day, the pressures in the fuel, oxidiser and pressurant (helium) tanks were found to be as low as 161, 479 and 115 kilopascals against the normal rated levels of 1550 kilopascals each.

Evidently, the oxidiser latch valve had not opened. The reason for this could have been either that it got stuck or that the 'open' command had not reached it properly. Normally, the valve is fit for more than nine million operations without defects. However, it is equally possible, say ISRO scientists, that it merely got stuck once but did function later.

As yet, no one knows why the failures took place, and why they occurred one after the other. Even less clear is the nature of malfunctioning, i.e., whether it was due to design inadequacies, or manufacturing defects, or insufficiency of command procedures.

It is possible that the cause is a combination of all three and that INSAT-IB will be equipped with better, more reliable, electronics and run with a more sophisticated procedures package so that the problems of its predecessor do not recur.

Meanwhile, Ford Aerospace personnel are also conducting a failure analysis. This will be critically examined by the high-powered investigation committee of the department of space. It is only when further investigations are made that the various hypotheses will be ruled out, modified or accepted.

CSO: 5500/7010

COMMUNICATIONS OFFICIAL TELLS PLANS, PROGRESS

Madras THE HINDU in English 27 Sep 82 p 9

[Text]

THANJAVUR, Sept. 26.

An agreement will be signed with the United Arab Emirate for laying an undersea cable between Bombay and UAE which will provide direct communication facilities between important Indian cities and 38 countries in the Middle East, Europe and Far East, Mr. Vijay Naval Patil, Union Deputy Minister for Communications, told pressmen here today.

Already, an undersea cable link existed between Madras and some Far East countries.

The Government had also entered into an agreement with a French firm for introduction of advanced technology in the Indian communications network.

Direct telephone facilities would be provided between all district headquarters and the respective State capitals in three years. A study had revealed that 80 per cent of calls in the country were made within the respective States.

It was decided to expand the Indian Telephone Exchange factory at Palghat in Kerala, which was manufacturing parts for electronic exchanges. The question of setting up a big factory in Bangalore for manufacturing equipment for electronic exchanges and expansion of the Indian Telephone Industries complex there was also under consideration.

Mr. Patil said the Communications department would shortly finalise the proposal of airlifting of mail to all important places, connected by air, and transporting it from airports by vans owned by the department to important towns.

More attention would be paid to opening post offices in rural areas, taking into account the 1981 population figures.

The foundation stone for the Rs. 2-crore 2,500-line automatic telephone exchange here was laid by Mr. Vijay Naval Patil, today.

He said the Government was taking steps to instal automatic exchanges in all important towns. Tirunelveli, Kanyakumari and Dindigul would have automatic exchanges within a year. The automatic exchanges at Thanjavur, Kumbakonam and Sivakasi would be completed within 30 months.

Mr. U. D. N. Rao, General Manager, Telecommunications said the experiment of introducing subscriber dialling facilities in the manual exchanges at Dindigul and Coonoor was quite successful. A similar facility would be provided in Thanjavur also.

CSO: 5500/7012

SPACE DEPARTMENT INVESTIGATING INSAT FAILURE

Bombay THE TIMES OF INDIA in English 24 Sep 82 pp 1, 9

[Article by Praful Bidwai]

[Text] Bangalore, September 23--The department of space is setting up a high-powered 20-member committee to investigate the causes of the failure of INSAT-1A and make recommendations for improvements in INSAT-1B as well as in operational practices to be followed by the Indian Space Research Organisation (ISRO) staff in future.

The committee, to be composed primarily of scientists not directly connected with the INSAT programme and of representatives of the users of INSAT services will examine all the computer logs which have recorded the instructions given to the dead satellite and its responses to them. It will study the report to be prepared by Ford Aerospace builders of the satellite who are fully responsible for the mission in the first 180 days after the launch.

It will also interrogate the personnel connected with the INSAT operations in order to find out the causes of the failure of the satellite and recommend changes in the design of INSAT-1B and the procedures to be followed in commanding it.

The committee is scheduled to submit its report in the last week of October.

A large number of ISRO scientists here expect the committee to recommend significant changes in the INSAT-1B control systems as well as procedures and to suggest a tightening of the project management and re-deployment of personnel.

An indication of the possible changes in the management structure is provided in a terse note by the ISRO chairman now being circulated among the space segment project office staff.

The circular SC/CH/1,12/293 from Prof. Satish Dhawan states: "On behalf of the government of India, I take full responsibility for all actions leading to the unfortunate loss of INSAT-1A, a major setback to the project."

It further adds: "While there is no reason to believe that everyone concerned has not performed the work assigned to the best and utmost of his or her ability, we are answerable to the government of India and to Parliament and must take all practical actions to progress the INSAT system.

"These will include a rigorous and thorough failure investigation, strengthening of our management team with possible additions and changes of personnel and work assignments, etc."

The circular warns: "All forthcoming events may or may not be to the express liking of everyone...(but) I expect everyone to rally round and do the best rather than ruminate over what might have been..."

The circular has not exactly boosted the morale of the INSAT project staff. But then they have already overcome some of their demoralisation over the past fortnight. Some of them are now busy running a computer programme that will recapitulate in detail the sequence of events between September 4 and 6 that led to the loss of INSAT-1A. This long and tiresome process--it takes days to recall and reorder the data received and recorded in a few hours--has already reproduced the broad sequence of failure events.

Inquiries with ISRO scientists here and at the master control facility at Hassan reveal that at least three distinct failures occurred on September September 4 when the satellite went out of control.

At 1356 IST (0826 GMT) on that day, INSAT-1A lost its altitude (its fixed orientation to the earth), suggesting a failure or malfunctioning of the satellite's sensors or an external interference with them or both.

Secondly, the satellite failed to respond to a command to put the high-power telemetry into operation--a routine manoeuvre resorted to when it loses its earth-lock which renders its normal orbit low-power telemetry less effective and reliable. This failure may be due to a malfunctioning of the switches that activate the high-power telemetry or to some other hitherto unnoticed manufacturing or procedural defect.

Finally, when in order to shift the position of the satellite, a command was sent to activate the fuel and oxidiser valves and to set off their combustion in order to drive the thrusters, the oxidiser valve did not open. As a result, the fuel leaked out in less than half an hour crippling the satellite for good. The failure of the valve to reopen may be a mechanical or an electrical/electronic one.

The specific genres and causes of these failures are now being investigated in greater detail. Several hypotheses are now in circulation but none of them has as yet found universal acceptance.

CSO: 5500/7007

SPACE OFFICIAL: SATELLITE SERVICES SET BACK A YEAR

Calcutta THE STATESMAN in English 16 Sep 82 p 9

[Text]

From Our Special Representative

BANGALORE, Sept. 15.—Satellite communication services in the country have been delayed by a year because of the failure of INSAT-1 A. Mr U.R. Rao, director of the Indian Space Application Centre here said today.

But the failure of India's first multi-operational satellite, which occurred 10 days ago, would not come in the way of the launching of the second satellite, INSAT-1B, scheduled for July next year from Cape Canaveral. INSAT-1B, now in an advanced stage of completion at Ford Aerospace the USA, where INSAT-1A was also built. The second satellite will be used essentially for meteorological and television broadcast services.

Mr Rao was opening a seminar on "engineering and the Dynamics of Development", organized by the Karnataka centre of the Institution of Engineers (India) to celebrate the 122nd birth anniversary of M. Visvesvaraya. He said that in the past two decades six satellites had been launched successfully, three for experimental purposes and three for technological purposes.

With this success, the country had moved to the operational stage. Now India was moving ahead with indigenously-built remote sensing satellites. The first of these was scheduled to be launched by 1986. This would enable a look into agricultural, geological and various other things of importance over the Indian sea and land mass.

Mr Rao warned against importing technology which might "greatly vitiate the dynamics of culture of the recipient country and thus defeat its very purpose". He said that imported technology had to be "culture specific". Compatibility between the receiver and donor of technology had to be established prior to its acquisition, he said.

UNI and PTI add: The country-wide colour telecast of the Asian Games through INTELSAT might not be possible, Mr Rao said. But colour telecast would be possible through the microwave link.

He said that INTELSAT, which was recommissioned following the failure of INSAT-1A, had only the C-band equivalent of INSAT-1A for telecom facilities and not the S-band transponder component needed for telecasting. He was not aware of the move to use a commercial satellite for colour transmission to throughout the country.

CSO: 5500/7002

TALK ABOUT THIRD SATELLITE DEEMED 'INDEFENSIBLE'

Calcutta THE STATESMAN in English 14 Sep 82 p 8

[Text] THE period between the ignominious end of INSAT-1A and the launching of INSAT-1B should give policy-makers an opportunity to re-examine the advisability of spending vast sums of money on such projects. Their relevance to Indian needs should be assessed with a full awareness of actual conditions rather than borrowed notions reinforced by the attractions of superficial prestige. Even when such considerations are swept aside, basic preparations are not made in time to make use of what such innovations can offer. That extension of television coverage was the primary objective of the satellite project was evident from the allocation of Rs 85 crores under this head compared with Rs 63.18 crores for telecommunications, Rs 12 crores for meteorology and a paltry Rs 2.98 crores for radio. But characteristic lethargy marked the Government's efforts even to set up the ground infrastructure for a satellite TV network. The educational programmes were almost a non-starter largely because very few of them had been prepared and few rural centres had received their community television sets. The targets for these sets had also been startlingly lowered from 100,000 to 400, to be raised to 8,000 in 1985. The costly satellite was apparently being used mainly for televising a one and a half hour national programme to eight urban centres every evening. Nor was full use being made of its other facilities. The Posts and Telegraphs Department was able to utilize only 300 of its 4,000 telecommunication circuits presumably because not all the earth stations were ready. The Meteorological Department seems to have had the worst deal, with only one of the projected 100 data collection centres having been set up so far.

This lackadaisical attitude was in sharp contrast, however, to the curious haste which had marked decision-making in acquiring the satellite, from the selection of the manufacturing company to the choice of an extremely complicated multi-purpose satellite with separate segments for television, telecommunications and meteorology. Later, when the defects became apparent, desperate efforts to correct them so that the satellite could become fully operational before the start of the Asian Games may have had an unfortunate effect. A review of its problems suggested "more tolerance" in dealing with an obstinate mechanism that was believed to be responsible for the jamming of the solar sail. Greater care is likely to be taken by the manufacturers and the Indian scientists in the fabrication, launching and subsequent manoeuvres of INSAT-1B. But optimism will be tempered by memories of INSAT-1A. Any talk at this stage of acquiring a third satellite is totally indefensible. The country must first know what exactly went wrong with the first and who were responsible. It would also be in order to reconsider the place of a satellite programme in the nation's order of priorities and the priority that television should enjoy among the project's varied uses. An enormous amount of time, energy and money has already been wasted on uncritical pursuit of a glamorous idea.

CSO: 5500/7001

CONFERENCE OF STATE INFORMATION SECRETARIES ENDS

Bombay THE TIMES OF INDIA in English 25 Sep 82 p 9

[Article by P.C. Gandhi]

[Text]

NEW DELHI, September 24.

THE two-day conference of secretaries of information to state governments to consider the report of the second press commission was marked by free and frank criticism of some of the major recommendations of the commission.

The conference, presided over by the secretary to the Union ministry of information and broadcasting, Mr. S. B. Lal, concluded here on Wednesday evening.

Most representatives from state governments were critical of the report. Some of them described it as an exercise in futility.

Some state representatives said that the report of the second press commission was inadequate in its content and vague on crucial matters. They maintained that the report of the first press commission was exhaustive and positive. The second press commission had not taken the thread ahead of the first commission.

Some state representatives went to the extent of pointing out that the report was not even happily worded. They described the drafting of the report as "poor".

The deliberations of the conference were businesslike and major issues were discussed in a free and frank atmosphere.

The Union ministry of information and broadcasting had sent abstracts of recommendations of the second press commission to all state governments and asked for comments.

The conference discussed the joint note of dissent by Mr. Justice Sisir Kumar Mukherjee, Mr. Rajendra Mathur, Mr. Girilal Jain and Prof. H. K. Paranjpe as members of the press commission.

Almost all representatives of the state governments emphasised the need to evolve a code of ethics for newspapers and journalists. They expressed their surprise that the second press commission had opposed that a code of ethics for newspapers should be evolved. They pointed out that the first press commission had recommended a 17-point code of ethics and expected that the second press commission should have improved upon that.

The press commission has recommended: "We are of the view that it would not be desirable to draw up a code of ethics for newspapers. Such a code could be built up case by case over a period of time."

Most state governments favoured delinking of newspapers from business houses and endorsed the views of the majority of the members of the press commission.

The state governments have rejected the recommendation regarding the setting up of an autonomous corporation which should take over the functions of handling government advertisements from DAVP. The commission had recommended similar bodies to be set up in states.

The conference also did not favour the recommendation of the press commission that daily newspapers should be left only in the private sector. Most representatives were of the view that if a state government was convinced that there was need for a daily newspaper to be published by the government, it should be free to do so.

CSO: 5500/7008

PLANS FOR LONG DISTANCE TELEPHONES REPORTED

New Delhi PATRIOT in English 21 Sep 82 p 7

[Text]

THE Posts and Telegraphs department has drawn up a plan to provide a Long Distance Public Telephone (LDPT) within five kilometres of any inhabitation using the new multi-access radio system, reports UNI.

Over 7000 such LDPTs are proposed to be installed in the next few years.

To bring with, imported systems are to be installed in 12 areas. The places selected are: Nizamabad, Dhuha, Nanguneri, Mirzapur, Paurl, Kaithal, Godhra, Mehsana, Bhind, Banda, Imphal and Agartala. Three hundred LDPTs are being opened in these places at a cost of Rs 5.3 crores.

The multi-access radio system can provide stable and good quality communication to approximately 30 villages from a base station which could be a district or taluk headquarters.

At present conventional overhead lines are being used for LDPTs. The system is not satisfactory as apart from the cost involved in laying overhead lines, the maintenance also poses problems due to the difficult terrain in which the LDPTs are located.

The new system will be economical. Through it a number of subscribers can get access to a certain number of radio channels on a multiple access basis. The system envisages a central base radio station feeding a number of subscriber radio station within a radius of 50 kms. The central station in turn is connected to the nearest telephone exchange either directly if it is nearby or through another radio link if it is farther away.

Three Indian companies have entered into collaboration with some foreign manufacturers for indigenous production of the system. The collaborators would supply a limited number of equipment for initial installation.

Meanwhile, Communication Minister A P Sharma in a bid to improve the services of the P & T department has convened a series of meetings of officers at various levels to review the position and take corrective action.

He has already met senior officers at Delhi. During the meetings he emphasised the need for acting promptly on complaints from subscribers. Whenever possible advance measures should be taken to avoid complaints, he told them.

On 24 September Mr Sharma will meet the heads of postal and telecommunication circles all over the country.

CSO: 5500/7006

WRITER EXAMINES TELEVISION TRANSMISSION PROBLEMS

Bombay THE TIMES OF INDIA in English 25 Sep 82 p 8

[Article by N.L. Chowla]

[Text]

IT is not surprising that the failure of INSAT-1A within six months of its launching, while its life had been expected to be ten years, should have caused a serious upset to our entire communications system and its development.

It was hoped that the INSAT would revolutionise long-distance telephone and the collection and transmission of meteorological earth observations and that it would extend radio and TV broadcasting to remote regions. It was also hoped that even though it was a domestic communication satellite, its utilisation could interest the neighbouring countries in due course.

The nationwide telecommunications link was to be provided through 28 stationary and three mobile earth stations. Within the country, the satellite was to make available over 4,000 telephone circuits of which 380 had already been commissioned. Similarly it was expected to provide half-hourly synoptic observations of weather systems including cyclones, sea surface and cloud temperatures. The satellite television was to cover the entire country through existing transmitters, 20 low-power transmitters which had already been ordered and through direct reception sets (DRS) which would have taken the signal directly from the INSAT-1A. Satellite television was to be utilised on an extensive scale, "as aid to economic and social development particularly in rural areas" and "to promote national and emotional integration." Only on August 15 did the INSAT-1A become fully operational for TV transmission. Educational TV programmes for rural areas in Andhra Pradesh, Orissa, Bihar, Maharashtra, Gujarat and Uttar Pradesh had not yet begun but a national hook-up TV programme for relay by all transmitters was started on independence day.

Major Setback

The entire INSAT project costing about Rs. 276.69 crores, the cost of the space segment of INSAT-1A alone being Rs. 113 crores, has been put in jeopardy, but we have it on the authority of Prof. U. R. Rao, director, Indian Satellite Centre at Bangalore, that there is no question of abandoning plans to launch the country's second multi-purpose satellite INSAT-1B in July next year. It needs to be said, however, that INSAT-1B, as envisaged, is in every way similar to INSAT-1A. In fact, it was supposed to back up INSAT-1A.

At the time of launching the first satellite, the chairman of the Space Commission, Prof. Satish Dhavan, had said: "The advantage of having two satellites at the same time is to increase the reliability of the segment. In case, there is a loss for some reason of part of the capacity or total capacity of a certain component, there will be another satellite to fall back on."

The major setback on account of the failure of the multi-purpose, multi-dimensional INSAT-1A will be felt in the immediate and long-term planning for the expansion of television in the country. TV's national programme has already suffered a setback. Eight of the 20 transmitting centres which are not in the microwave circuit are out of range for any relay of TV network programmes. These centres are Hyderabad, Sambalpur, Gulbarga, Pij, Raipur, Jaipur, Muzafarpur and Nagpur.

Clusters of selected villages in Andhra Pradesh, Orissa and Maharashtra which were to be benefited in the first phase by Direct Reception Sets (DRS) will not be reached. The 20 low-power transmitters being imported for countrywide telecast of the

Asian Games to serve several regions; including the north-eastern regions, cannot be used unless they are located on the micro-wave network.

The INTELSAT-V, an international satellite on the Indian ocean, can be hired to provide most of the TV linkages that had been assigned to INSAT-1A. The INTELSAT can feed the 20 low-power transmitters as also the eight existing transmitters which are not on the microwave circuit. But the signal from this international satellite is much lower than that of the INSAT. Its frequency of operation is also different. Therefore, the international satellite cannot be used to provide the signal to the DRS.

Option Open

Doordarshan will have to make modifications in the receiving equipment because this equipment is intended for the frequency of operation of INSAT (2.5 GHZ), whereas the INTELSAT is on a frequency of 4 GHZ. These modifications are possible.

The annual hire of the INTELSAT channel is around Rs. 2 crores. The channel is immediately available. The financial commitment will have to be made soon while the option is still there. It can also be argued that hiring the INTELSAT channel and installing transmitters to receive the signal and pass it on within a given area is cost-effective. The low-power transmitters can be located in the same target districts envisaged for the DRS. A low-power transmitter costing less than Rs. 20 lakhs can serve around 300 to 500 sq. km. On the other hand, the cost of one DRS is about Rs. 30,000. If 100 DRS are deployed in a given area, their cost alone will be Rs. 30 lakhs.

Through a low-power transmitter, the cost will be less than Rs. 23 lakhs for the same number of ordinary community receivers. The installation of terrestrial transmitters will also enable individual homes in urban or rural areas within the range to have TV receivers of their own.

It would, thus, appear that the use of INTELSAT-V, installation of low-power transmitters and provision of ordinary community receivers will meet the demands of extending television to different parts of the country.

A relevant question that can be raised is whether TV should be used only for hook-up national programmes or considered a local medium for putting out programmes in regional languages and dialects and dealing with problems specific to an area. In a country of India's size a hook-up programme has limited relevance. The controversy on TV's national programme has not ended; it has only been overtaken by the failure of INSAT-1A. The planning of software is perhaps a challenge much bigger than the provision of satellite technology for transmission.

CSO: 5500/7008

BRIEFS

INDIAN SATELLITE OFFER--Paris, Sept 24 (PTI)--India has offered the use of its communications satellite to third world countries through UNESCO. Speaking at the organisation's executive board, the Indian member Triloki Nath Kaul said UNESCO could consider putting the satellite India had developed for transmitting educational and cultural programmes. India would be happy to share its knowledge and infrastructure with the Third World, he added. [Text] [New Delhi PATRIOT in English 25 Sep 82 p 3]

COMPUTER HARDWARE IMPORT--New Delhi--The Federation of Indian Exporters Organisations has urged the Government to allow freely import of latest computer hardware without customs duty against export of computer software. According to FIEO, the potential of software exports was virtually unlimited as the advanced countries are facing a crisis in this field due to non-availability of manpower. India is in an unenviable position to fill this gap. It therefore wants the Government to give special encouragement to tapping the potential area by freely allowing latest hardware to be imported for export projects without customs duty. It has also made a number of other suggestions in a memorandum to the Government to promote export of consultancy services. It has urged that a portion of credits to friendly countries should be earmarked for the use of Indian consultancy services. In order that the selection of Indian consultants for rendering services against bilateral credits as well as against technical assistance funds is as broadbased as possible, the Government could consider utilising the services of FIEO. It wants the Government to consider including leading consultants on official delegations visiting other countries. Consultancy organisations which wish to render services for the export market should be allowed liberal import of office equipment and instruments, scientific aids, etc. An inter-ministerial committee has also been suggested to coordinate, promote and expedite decisions relating to export of consultancy services. [Text] [Madras THE HINDU in English 26 Sep 82 p 3]

ELECTRONIC EXCHANGE FACTORY--Bangalore will not be getting the factory for the production of electronic telephone exchange equipment with an annual capacity of five lakh lines at Hosur Road in collaboration with CIT-Alcatel of France. Mr. A. P. Sharma, Union Communication Minister, mentioned here today towards the end of his first press conference that the electronic exchange factory would be located at Gonda, in U.P. The Indian Telephone Industries Ltd., was dismayed by the earlier decision of the Government to have the factory at Gonda instead of at Hosur Road where infrastructural facilities have been created. Gonda has no such facilities and it will take many years for the factory to come up. Mr. Gundu Rao, Karnataka Chief Minister who was perturbed by the Centre's choice of Gonda, took up the matter with the Prime Minister, Mrs. Gandhi and Mr. C. M. Stephen, former Union Minister for Communications. It appeared that the factory would be located in Bangalore. It was then proposed that the factory for the manufacture of telephones in collaboration with Face Standard of Italy be located at Gonda with an annual capacity of five lakh instruments. The proposal to accept the Face Standard's Offer of Technology for the manufacture of the new telephone has been cleared by the Public Investment Board. [Text] [Madras THE HINDU in English 17 Sep 82 p 9]

CSO: 5500/7003

DIGITAL EXCHANGE SYSTEM BY END OF 1984

Kathmandu THE RISING NEPAL in English 30 Sep 82 p 1

[Text]

Nepal's communications facilities will take a big step forward when the digital exchange system is installed by the end of December 1984, telecommunications sources said here Wednesday.

The project will add 22,750 automatic lines throughout the Kingdom, 12,000 in Kathmandu valley alone.

Digital exchange like other automatic exchanges allows two parties to communicate without the help of the operator.

Digital means the information in-flow is coded based on a pulse pattern imitating these.

The information flow, therefore, is not continuous but broken up rapidly.

The information, before reaching the human ear is re-synthesized to give it an unbroken fell.

The rate of information breaking-up and re-joining is controlled by micro computers, and the caller can place and complete the call uninterrupted.

The manner of control is specified in the micro computer memory; The exchange sets up the call with the help of the memory and the number dialed.

The sources said the estimated cost of the project is 35.4 million U.S. dollars including 27.3 million in foreign currency expense on equipment and services.

International Development Agency (IDA) credit financing for the project is about 15.3 million U.S. dollars and 12 million U.S. dollars will be provided by His Majesty's Government.

A contract for the digital exchanges together with associated transmission links was signed last May. The cables have already been ordered.

The offers for telephones instruments such as the telephone sets have already been received. The number of existing microwave channels are to be increased for which a tender will be invited, the source said.(RSS)

CSO: 5500/4303

BRIEFS

DIRECT TELECOM LINKS WITH BANGLADESH--Chandragadi, (RSS)--Direct telecommunication links between Nepal and Bangladesh is expected to begin from October 16. Meanwhile, Nepalese and Bangladesh technicians are engaged in establishing communication links between the microwave tower of Bhadrapur and the terminal tower of Atubari, Bangladesh. The aerial of the Bhadrapur microwave station was installed Sunday, it is learnt from sources concerned. [Text] [Kathmandu THE RISING NEPAL in English 28 Sep 82 p 1]

CSO: 5500/4303

BRIEFS

APPLE COMPUTER OFFER--Half-price computers for primary schools and training courses for new secondary-school users are the latest plans of the distributors of Apple computers. CED Ltd of Auckland plans to offer a discounted computer to each primary school now that it has succeeded in selling computers at $2080 each to nearly 360 of the 393 secondary schools. The primary school offer will be open for a year and be backed by training programmes for teachers. The discount offer by the Californian company brought a complaint of unfair competition by the manufacturers of the New Zealand Poly computer. A special customs duty of $880 was imposed but this did not deter school purchases at the new price of $2080. Before Apple's special offer, a Poly was priced at $3890 compared with $4812 for the Apple. [Text] [Wellington THE EVENING POST in English 11 Sep 82 p 5]

CSO: 5500/9039

BRIEFS

SICHUAN NATIONAL COMMUNICATIONS MEETING--The national academic discussion meeting on communications work in mountainous areas, which was sponsored by the China Electronics Society, was held in Chengdu Municipality, Sichuan Province, from 21-26 September. Some 110 experts in communications and technicians from postal, telecommunications, railroad, power, broadcasting and meteorological, mining departments, PLA units, factories, and scientific research departments, universities and colleges attended the meeting. The meeting received 61 theses and articles on communications work in mountainous areas. The meeting conducted investigation of the application of microwaves in mountainous areas in the province. [HK020916 Chengdu Sichuan Provincial Service in Mandarin 0030 GMT 30 Sep 82]

HAINAN TV STATION--Guangzhou, 21 Sep (XINHUA)--A new television station, the Hainan Television Station, was recently set up in Haikou Municipality on Hainan Island in Guangdong Province. In addition to relaying programs of the Central Television Station and the Guangdong Television Station, this new station will make and broadcast its own programs. At present, there are about 450,000 television sets on Hainan Island and television programs can be received in mountain areas, fishing ports and villages of minority nationalities, thus enriching the cultural life of the people of all nationalities on the island. [OW051044 Beijing XINHUA Domestic Service in Chinese 0006 GMT 21 Sep 82]

CSO: 5500/4102

BRIEFS

DIRECT TELECOM LINKS--With the installation of single channel per carrier (SCPC) equipment at the Satellite Station, Padukka, direct routes have been established with five countries viz Kenya, Saudi Arabia, Bangladesh, Thailand and Maldive Islands a press release from the Ministry of Posts and Telecommunication announced yesterday. The commissioning of these direct routes will enable operator-assisted calls without delay to these countries the release adds. The overseas telecommunication service provides international telephones service to all countries of the world and is available to over 25 countries the press release concludes. [Text] [Colombo SUN in English 30 Sep 82 p 3]

CSO: 5500/4303

BRIEFS

ZFB ANTENNA PLANS--The Bermuda Broadcasting Company, owner of ZFB and ZBM, has applied for planning permission to build a steel tower on top of its Prospect studios. A company spokesman said the tower was needed to hold antennas which will pick up signals from ZFB radio and television transmitters and feed them to the public. ZFB antennas, along with the rest of the station's studio, will be moved to Prospect. [Hamilton THE ROYAL GAZETTE in English 18 Sep 82 p 5]

CSO: 5500/7501

BRIEFS

NEW ANTI-SANDINIST RADIO--San Pedro Sula--Radio Sandino has recently gone on the air. Radio Sandino is the voice of the free Nicaraguan people, which, via the air waves, will report on the Sandinist revolution's activities against the "commanders," currently in power in Nicaragua, who are turning the government over to foreign interests. Radio Sandino can be heard on the 49 meter band, 6,200 khz, at the following hours: 0500-0600, 1830-1930 and 2200-2300. Radio Sandino's programs were heard for the first time a few days ago. [Text] [PA061754 San Pedro Sula LA PRENSA in Spanish 29 Sep 82 p 48]

CSO: 5500/2004

BRIEFS

JBC RADIO CENTRAL START-UP--JBC Radio Central in now officially on the air. Following a period of regular test transmissions, the station had its first official broadcast on Monday, September 6. Broadcasts can now be heard between 5.00 p.m. and 7.00 p.m. Mondays to Fridays on --790 KZ. On "Country Radio" (as Radio Central is called) priority is given to agriculture (primarily as it relates to farmers receving assistance under the Second Integrated Rural Development Project), education, health, nutrition and family planning. The United States Agency for International Development (USAID) has been assiting the Jamaica Broadcasting Corporation in this bold, new thrust--a thrust to promote rural development and to help people to help themselves. Residents of Manchester, Clarendon, St. Elizabeth, St. Ann, Trelawny, and St. Catherine are now invited to "Come to Country, Come to Central--JBC Radio Central." [Kingston THE DAILY GLEANER in English 16 Sep 82 p 5]

CSO: 5500/7501

TELECOMMUNICATIONS PROJECTS UNDERWAY IN COUNTRY

Puerto Cabezas Project

Managua BARRICADA in Spanish 31 Aug, 1 Sep 82

[ANN special service for BARRICADA, article by Gabriela Selser]

[31 Aug 82 p 9]

[Excerpts] Traditionally separated from the rest of the country by the political-economic interests of Spanish and British colonialism, and later condemned by the Somoza regime to backwardness and poverty, the population of the Atlantic coast of Nicaragua now sees hope for social development through the different programs which the revolution is pushing forward in order to integrate the entire national territory.

The many efforts made by the revolutionary government to bring communications to the most remote regions of the country fit into this framework and the best example is the development of the Matagalpa telecommunications project, in Puerto Cabezas, which is being pushed forward by TELCOR [Nicaraguan Telecommunications and Postal Services Institute], starging with the work which is being performed voluntarily by hundreds of its workers who are now in the mountains and the jungles of the northern part of the country.

The project, in which up to now 480 TELCOR workers organized into brigades have participated, is undertaking to put into place 8,100 telephone poles over a distance of 425 km starting at the San Ramon area of Matagalpa (where the first pole was placed on 11 May 1982) and ending at Puerto Cabezas which in a few months will have the first telephone, telegraph and radio service office in the Atlantic area.

All Participate

Up to now 1,484 poles have been put into place over a distance of 120 km.

At the present time work is being done in the Waslala area by the TELCOR Fourth Work Brigade, "Heroes of Pancasan," which is continuing the work carried out over a period of 4 months by volunteer brigade groups of 100 to 120 workers each.

Also participating in the program are 30 technicians, drivers and directors who have been with the project continuously since its very beginning.

With an overall budget of 28 million cordobas ($2.8 million) of which 10 million are earmarked for the purchase of material abroad, TELCOR is investing--not counting the work days voluntarily performed--1.5 million cordobas per month in the purchase of material for the project (concrete poles, crosspieces, aluminum wire and insulators).

Engineer Bismarck Rodriguez, head of the Matagalpa-Puerto Cabezas project, stated that TELCOR still faces serious difficulties, especially with regard to logistic support (scarcity of materials, tools and spare parts).

He added that the Ministry of Construction (MICONS) had committed itself at the beginning to help provide materiel (trucks, among other things), but that "that commitment had been fulfilled only sporadically."

"The lack of assistance," Rodriguez said, "has seriously hindered the progress of the project."

A Revolution Inside TELCOR

However, the program is going forward, thanks to the incredible effort of the TELCOR employees, says Cap Enrique Schmidt, TELCOR minister; he himself has gone volunteer work on the project, along with the other workers.

Schmidt pointed out that the volunteer workers are neither experts nor specialized construction workers but postmen, cashiers, window clerks, office clerks who--without knowing anything about mountain work--are participating in the job, learning as they go along.

All of the Matagalpa-Puerto Cabezas Project workers, while keeping to a strict daily schedule, also keep alert for any situation which might arise in the area, understanding the current danger of armed attacks which the northern region is experiencing.

Crossing rivers, carrying out maneuvers in the mountains and doing physical exercise, the TELCOR employees are undergoing training like militiamen engaged in periodic combat preparation.

[1 Sep 82, p 4]

[Excerpts] The Matagalpa-Puerto Cabezas telecommunications project, which within the next few months will put into operation the telephone, telegraph and radio system for the Atlantic area, is now in its fourth stage, in which 120 TELCOR [Nicaraguan Telecommunications and Postal Services Institute] employees, organized into the "Heroes of Pancasan" Volunteer Work Brigade, are participating.

The brigade, which has its camp on the La Mora farm near Waslala, 60 km from Matagalpa, consists of workers from the various TELCOR centrals throughout the

country, who are doing real "ant work" placing telephone poles--one every 50 meters--along the mountain highway which leads to the Atlantic coast.

Because of the scarcity of materials and of technicians, it is the workers themselves who open up paths through the mountains, hacking off branches and clearing the land with machetes, in order to be able to set up the telephone poles in predesignated locations. Each post weighs about 200 lbs and must be carried on the shoulders of the men of the volunteer brigade.

Nevertheless, the work is progressing efficiently and the Fourth Brigade has even decided to stay 2 additional weeks in the mountains, even though the period of its stay in Waslala (approximately 1 month) will come to an end in the next few days, so as to allow for the entry of new groups who will continue the job which was started last May [1982].

Bismarck Rodriguez, director of the Mataglapa-Puerto Cabezas project, said that there are many difficulties. Due to inexperience in this work many errors have been committed, especially in the first months, but the mistakes have been corrected by the technical advice given during the last 3 months by a Cuban volunteer brigade which is supervising "in situ" the execution of the program.

The work of erecting telephone poles follows a definite method which starts with the taking of measurements and marking the ground and ends with the fixing of posts in the ground and the subsequent placement of crosspieces (horizontal supports the telegraph cables rest on).

The project will be completed next December. Puerto Cabezas will also have a telephone office, the first in the history of this region.

Other Projects Described

Managua EL NUEVO DIARO in Spanish 8 Sep 82 p 10

[Text] TELCOR [Nicaraguan Telecommunications and Postal Services Institute] has reported that in a short time telephone service between Occidente and Managua and between Matagalpa and Managua will be substantially improved when the new automatic facilities and expanded microwave channels enter into service.

TELCOR also reported on the enormous efforts being made to bring telecommunication from Managua to Puerto Cabezas and vice versa and on the installation of 200 public telephones from Japan in the capital and the other departments.

TELCOR efforts are also being directed toward strengthening telecommunications independence on the international level through the installation in 1983 of an earth satation (inter-Sputnik) which will provide direct communications between our country and the socialist community.

Engineer Marne Serrano, TELCOR deputy minister for technical affairs, gave the following specific details on improvements made in the telephone network and buildings in order to provide better service to subscribers:

At Las Palmas the automatic installation will increase its capacity from 2,800 to 5,000 subscribers starting in November, 1982.

The chinandega telephone exchange will have a capacity of 3,000 subscribers by the beginning of 1983 instead of 1,000 which it has now.

In the municipalities of Corito and Chichigalpa automatic plants of 600 and 400 subscribers respectively will be installed.

In La Paz Centro and Nagarote the TELCOR buildings will be completed by October 1982. They will each have an installation with a capacity of 163 subscribers.

In Leon a new building will have been finished by March 1983 and by the end of 1983 the installation of an automatic installation with a capacity of 5,000 subscribers is planned.

In El Viejo, El Sauce and Puerto Sandino the construction of new buildings, which will house automatic plants, will also begin in 1983.

The total cost of the project for improvements in communications in Occidente including the buildings is 84.7 million cordobas of which TELCOR is contributing 51 million and the rest is provided through a line of credit from the German Democratic Republic (RDA).

Serious Problem in the North

At present communications constitute a serious problem in Matagalpa because the facilities already installed have only 24 channels which means that only 24 subscribers can communicate at any one time between the City of Matagalpa and the rest of the country. TELCOR is making investments with a view to doubling the capacity of the microwave channels by the end of October 1982 and tripling that capacity in 1983. The automatic facilities will have a capacity of 2,000 subscribers. The equipment needed to expand the channels costs $100,000 (1 million cordobas).

At the same time work will be done on a physical line project to provide 24 more public service lines passing through Sebaco and Ciudad Dario Matagalpa. This project will cost 4.5 million cordobas. In the City of Matagalpa, which after the triumph of the 19 July revolution was left without communications as a result of the war of liberation, an interurban exchange costing $700,000 (7 million cordobas) will be installed in order to provide communications b etween the municipalities of the department and the rest of the country.

More Pay Telephones in Managua

For Managua and the rest of the country, the first 200 pay telephones out of an order of 700 purchased in Japan will begin arriving this month.

One hundred of these telephones will be installed in the various districts of Managua and 100 in the rest of the country. The remainder, that is, the other

500, will be similarly distributed throughout Managua and the departments in 1983. These telephones cost $500 apiece and the caller can use them for 3 minutes with a one cordoba coin.

Expansion and Independence

The expansion of the international exchange, which will have new circuits, has been begun with a loan of $5 million (50 million cordobas) from the BCIE [Central American Bank of Economic Integration]. The first phase of this expansion work will cost $300,000 (3 million cordobas).

Before 19 July 1979, Nicaragua depended on U.S. channels for communications with other countries. Today, on the other hand, there is direct communication with about 12 countries including Spain, brazil, Italy, the Federal Republic of Germay, Cuba, Canada, the United States, Switzerland and England.

New Telex Exchange

Another achievement of TELCOR in 1982 has been the installation of a new Telex exchange worth $400,000 which has a capacity of 512 lines. This has doubled Telex service which is in great demand in revolutionary Nicaragua.

Marne Serrano said that another achievement which is underway and will be completed by the end of this year if no major problems intervene, is the Matagalpa-Waslala-Puerto Cabezas communications project which is costing 28 million cordobas.

9204
CSO: 5500/2000

OVER 60 TV TRANSMITTERS PLANNED

Jiddah ARAB NEWS in English 19 Sep 82 p 2

[Text]

JEDDAH, Sept. 18 (SPA) — Television transmitters in Saudi Arabia total 62, including the ones in Riyadh, Jeddah, Dammam, Qasim, Madinah and Abha, Information Minister Dr. Muhammad Abdo Yamani said Saturday. He added that the television complex in Riyadh is being handed over and that, soon, the Channel 2 project in Jeddah, Taif, Makkah and Dammam will be ready.

Meanwhile, construction of two television production centers in Qasim and Madinah and ten transmitters has started. The transmitters will be located in Hail, Shaqra'e, Baha, Hafr-el-Baten, Tabuk, Yanbu, Hofuf, Sharoura, Badana and Al-Zalfi. The centers will be able to transmit two TV programs and a broadcasting program at a time. In addition, the information ministry has commissioned a specialized firm to set up 20 TV transmitters in various areas in Saudi Arabia.

Dr. Yamani vowed that the government will see to it that every citizen in any spot, any village in Saudi Arabia enjoys television transmissions as soon as possible. He said that giant strides had already been made in this direction, adding that the ministry had already completed the preliminary studies for the Saudi Arabian satellite, which will provide the quickest means to cover all parts of the Kingdom and many areas in neighboring countries with minimum costs and manpower.

The satellite will be useful in educating the people through documentaries and educational programs. The satellite will transmit two TV programs on separate channels, besides covering I Information ministry and Saudi Press Agency telex and teleprinter requirements.

The project will consist of an operating satellite and a spare one, as well as a ground control, communications and central transmission station. There will also be three transmitters and antennas in the three principal areas in Saudi Arabia, and other facilities like radio transmitters and three mobile units for outside TV and radio broadcasts. The signals will be sent to the satellite and sent back to the viewers on Earth. Dr. Yamani pointed out that the Saudi satellite is manufactured by French Space Industries.

CSO: 5500/4502

BASSA CHRISTIAN MINISTERS ASSOCIATION TO CONSTRUCT RADIO STATION

Monrovia DAILY OBSERVER in English 23 Sep 82 p 10

[Text]

Construction of a broadcasting station estimated at $150,000.00 is expected to commence shortly in Buchanan City, Grand Bassa County.

The radio station, which will cover a radius of 70 miles, is being built by the Bassa Christian Ministers Association in collaboration with the Christian Refund World Mission and other American churches.

Speaking at a fund-raising rally on Sunday at the World-wide Mission auditorium in Buchanan, the assistant minister for Telecommunications and Planning, Mr. S. Richelieu Watkins, underscored the need for an effective communication system.

Minister Watkins said the initiative of the Bassa Christian Ministers Association and its American allies should be seen as another "source of education" for residents of Bassa County.

He said the station, when completed, would also be of spiritual value in that it will educate the minds of the people of the area to the good qualities embedded in the Christian religion.

Describing the proposed station as a "dynamic and timely venture", Minister Watkins, who established the first radio station in Liberia, hoped that the programs to be aired on the new station would enhance nation-building and unity among the people.

Mr. Watkins, who made a financial donation of $100.00 toward the rally, challenged the citizens and residents of Grand Bassa to lend their moral and financial support to the association to have the station completed.

Mr. Thomas Johnson, who deputized for Bassa Superintendent Major John Y. Krekue, assured the association of the support of the county's administrators.

Mr. Johnson, who is the County Administrator, praised the Ministers Association for what he called a "worthy and fruitful project", in the interest of the people of Bassa.

Explaining the technical part of the station project, Mr. Ronald Ayers said the broadcasting station would cover the whole of Grand Bassa County and can be picked up by certain parts of Montserrado County and other surrounding areas.

Mr. Ayers, project coordinator, did not say when the radio station will air its first program.

However, at the rally on Sunday, the association realized $2,622.50 as a contribution from residents of Bassa toward the construction work, reports our correspondent in Buchanan, E. Willis Crayton.

Under a cooperation agreement, the Christian Refund World Mission based in California, USA will provide over three-fourths of the project cost.

According to sources close to the mission, the money for the radio project comes as aid from the mission to help in enhancing communication between christian churches in Bassa and its nearest parts.

The Christian Refund World Mission is the parent organisation of the Liberia Christian Foundation. It has funded the founding of the Liberia Christian College and the Liberia Christian High School in Buchanan, Grand Bassa County.

CSO: 5500/4

TPTC, SWEDISH TELECOMUNICATIONS AUTHORITY HOLD TALKS

Dar es Salaam DAILY NEWS in English 29 Sep 82 p 1

[Excerpt] OFFICIAL talks were held in Dar es Salaam at the weekend between the Tanzania Posts and Telecommunications Corporation and the Swedish Telecommunications Authority.

A TPTC official said the talks were aimed at reviewing the existing co-operation agreement and the possibility of exploring other areas of co-operation.

Tanzania was represented at the talks by the TPTC Director-General, Ndugu William Maeda, while the Swedish team was represented by the Director-General of the Swedish Telecommunications Authority, Ndugu Tony Hagstrom, who is also Chairman of the Board of Directors of the Swedish Telecommunications International Consultancy Organisation.

Ndugu Hagstrom arrived in Dar es Salaam at the head of a three-man team, en-route to Nairobi, Kenya, for the general conference of the International Telecommunications Union (ITU).

Under existing agreements, Sweden finances five on-going projects valued at over 30 million/- between 1981-1983.

The projecs are the TPTC training centre at Kijitonyama in Dar es Salaam, maintenance of subscribers network, network modernisation, supplies management and organisation, and telecommunications repair service.

These projects come under the Tanzania-Sweden import support co-operation agreement.

The TPTC official said the other areas to be explored during the talks included postal planning and training, printing unit, motor vehicle repair shops, job analysis, and evaluations.

Others in the Swedish delegation were Sven-Roland Letzen, Finance Director of the Swedish Telecommunications Authority and Janne Blohm, Managing Director of the Swedish Telecommunications International Consultancy Organisation.

CSO: 5500/4

BRIEFS

PRC RADIO PROJECT DISCUSSED--Zanzibar: Tanzania's ambassador to China, Ndugu Job Lusinde, held talks today with Minister of Information, Broadcasting and Television Ndugu Issa Mohamed. During the talks Ndugu Lusinde and Ndugu Mohamed dealt with the installation of a radio equipment project financed by the Chinese Government. Ndugu Lusinde then visited the project to see the progress of work on the installation of equipment at Dole and also met with Chinese experts. Ndugu Lusinde wished the Chinese experts well in their work. Work on the project is expected to be completed within 2 years. Ndugu Lusinde was accompanied by senior officials from the Ministry of Information, Broadcasting and Television, and other officials from the Foreign Affairs Department in Zanzibar. [Text] [EA140918 Zanzibar Domestic Service in Swahili 1600 GMT 9 Oct 82]

CSO: 5500/11

PRESIDENT KAUNDA EXPRESSES CONCERN ABOUT FAULTY TELEPHONE SERVICE

Problem Needs Swift Attention

Lusaka TIMES OF ZAMBIA in English 7 Oct 82 p 1

[Excerpts] President Kaunda has expressed concern at the poor state of telephone services in the country.

"It appears every time one wants to use the phone something goes wrong."

The President said the telephone problem "needs swift attention."

He said this at State House when French industrialist Mr Bernard de Gaulle called on him yesterday. Mr de Gaulle is a nephew of the late French president Charles de Gaulle.

Mr Bernard de Gaulle is director of Cit-Alcatel, a telecommunications company which is trying to improve the country's telephone system.

Accompanied by area manager Mr Guy Foressim, Mr de Gaulle has been holding talks with Government officials and those in the Posts and Telecommunications Corporation (PTC).

He said his discussions centred on all aspects of telephones and the financing of the system.

France had been involved in a number of similar projects throughout the world.

Telephoning 'Painful Experience'

Lusaka TIMES OF ZAMBIA in English 7 Oct 82 p 1

[Editorial]

[Text] In Zambia telephone nightmares are a daily painful experience for those who have to rely on the telephone for most of their work.

But instead of succumbing to the madness and frustration they cause one learns to tolerate the intolerable hoping for the better.

So until yesterday little did the nation know that even President Kaunda, of all people, is a victim of those telephone blues.

Patience, however, has its own limits. When he spoke yesterday to publicly express concern at the poor state of the telephone services in the country, the President was highlighting a problem shared by many telephone users.

Given the new six digit telephone numbers, making a local call is still a big problem. Crossed lines are the order of the day. You try hard to dial the right number, but you certainly land up being answered at the wrong number.

In the end, after some endless time-wasting, you find that it is easier (like in the case of Lusaka) to walk or drive from one end of Cairo road to the other than it is to phone.

If you seek to book an international call at 0800 hours, you can, however, all things considered, raise the operator with remarkable speed. It only takes about ten minutes of repeated dialling.

You are then told, yes, you can have a call in about 45 minutes. Yes, they will call you back. An hour-and-a-half later you seek to inquire what has happened to your call--and that takes some doing.

When you fail there you dial a variety of numbers for "international" for more than half-an-hour and each time the engaged tone signals.

Then you try to dial the senior telephone superintendent, the international exchange supervisor, the telephone exchange superintendent and what have you.

In each case you get exactly the same result: the number begins to ring and then stops, indicating that some sort of cut-out device is being used. Clearly the august personages do not want to be bothered by you.

In desperation your eye catches sight of a number marked "emergency" in the directory and so you dial that.

Immediately a crisp voice says: "do you want police, fire brigade or ambulance?" You say, well if you don't get international soon you may be needing an ambulance, can you be helped?

But unfortunately the dear lady switches you off. So back to dialling 100. Another ten minutes and then suddenly in that desert of technological acoustics, oh joy, oh wonder, there is a sound of human voice. "Can I help you please?"

"Well," you gulp, feeling like a man dying of thirst being offered a clear clean glass of cool delicious water, "actually yes, you can. Is it possible to get international?"

You are asked to hold on. One thing, when you get through to them, the operators are always beautifully polite. No complaints there.

But the number rings and rings and later you are told there is no reply. And so it goes on.

At present to pick up the phone and dial any exchange service and to get an immediate reply is not just an ordinary telephone event. It is a near miracle, like winning the pick-a-lot jackpot.

CSO: 5500/10-E

BRIEFS

TELEVISION MICROWAVE LINK--Zambia Broadcasting Services and Television Zambia will start transmitting programmes from the new mass media complex this week, Permanent Secretary in the Ministry of Information and Broadcasting Services, Mr Edward Lubinda has disclosed. Mr Lubinda said the long awaited television microwave link equipment ordered by the Posts and Telecommunications Corporation (PTC) has arrived in the country and has already been installed. Mr Lubinda also disclosed that the staff canteen at the mass media complex will start operating on October one. He confirmed that the Evelyn Hone College Hotel will run the canteen under an agreement with the ministry. ZANA. [Text] [Lusaka DAILY MAIL in English 27 Sep 82 p 5]

CSO: 5500/4

COMPUTER CENTER AIDS PROGRESS

Harare THE HERALD in English 24 Sep 82 p 6

[Text] Zimbabwe's scientific computer centre is capable of servicing up to 28 ministries and should have spare capacity for the private sector, the Minister of Finance, Economic Planning and Development told the Assembly.

Speaking during the committee of supply debate on the economic planning and development vote, Dr Bernard Chidzero said the computer, acquired from Canada and installed with United Nations assistance, would initially service some 15 ministries. One of the centre's first tasks would be processing the data obtained from the recent census and it would be used to help plan development projects.

Replying to Mr Bill Irvane (Ind, Marlborough), the minister said the centre should have spare capacity for the private sector, since it would not be fully used all the time.

On the $1,1 million audit vote, Cde Chidzero said the Audit Department was working with less than half its staff complement.

Mr Irvine had sought an assurance that the department would be properly staffed with qualified people as soon as possible.

The minister said the department's problems were caused by the acute shortage of staff, the expansion of Government activity after independence with the resulting spending rise and the competition between Government and a private sector which offered higher pay and better working conditions.

Staff problems would be alleviated when more Zimbabweans had been trained. There were now a number of students at the Harare Polytechnic being sponsored by the Audit Department, who should be able to join the service on completing their courses.

Cde Chidzero said it was important to get "seasoned and experienced" staff rather than just make up numbers.

Both the economic planning and development vote and the audit vote were approved.

CSO: 5500/3

STUDY PREDICTS EUROPEAN DATA PROCESSING MARKET

Paris ELECTRONIQUE ACTUALITES in French 10 Sep 82 p 7

[Unsigned article]

[Text] The European data processing market will go from 54.7 billion dollars in 1981, to 151.9 billion in 1987, according to a recent IDC (International Data Corporation) study. The study also indicates that among the European countries, France has been the largest investor in data processing for 1981. Moreover, the next five years will be marked by the development of distributed data processing.

The study, covering 260,400 European enterprises, investigated very diverse situations.

For instance, the average expenses of a small business amounted to 12,200 dollars in 1981, while those of a banking institution reached 1.4 million dollars.

Overall, European data processing expenses in 1981 amounted to 54.7 billion dollars, of which 50.2 billion were for "internal" costs, and 4.5 billion were subcontracted.

Of the 54.7 billion dollars, 26.7 billion were allocated to operating costs for data processing services, and the other 28 billion were for equipment purchases (hardware and software).

According to the study, investment costs divided as follows: 55 percent for hardware acquisition (15.3 billion dollars), and 33 percent for programs and software (9.3 billion dollars); the remaining 3.4 billion dollars were earmarked for supplies and remote transmission budgets.

France Leading in 1981

Geographically, France leads the European market for 1981, with expenses of 6.3 billion dollars, ahead of Germany (6 billion), England (5.5 billion), and Italy (2.7 billion).

Germany's second position comes as a surprise, the country being generally considered as the first European market in data processing. This classification is explained, according to the study, by the addition of hardware and software in total expenses. Indeed, a more detailed analysis shows that France leads with software expenses at 1.2 billion dollars, against only 0.7 billion for Germany in 1981.

If we analyze the expenses for hardware, Germany takes the lead with 3.5 billion dollars, ahead of France (3.3 billion) in 1981.

France's large software expenses confirm the strong position of French SSCI (Computer Information and Assistance Companies) on the European market.

It should also be noted that with respect to PIB (Gross Domestic Product), it is Great Britain that has invested the most in data processing in 1981.

In terms of sectors of activity, government institutions and services constitute the largest users, with 8.3 billion dollars in 1981, ahead of industry (7.2 billion) and the financial sector (4.4 billion).

These three sectors add up to 71 percent of the European data processing expenses.

Development of Distributed Data Processing

According to the study, an analysis of the market evolution makes it possible to predict a 23 percent per year growth in software services, and especially a 29 percent per year growth in remote transmission equipment, until 1987.

Hardware expenses as a whole will only increase at an average of 16 percent per year during the same period.

As a result, the magnitude of investments in software will increase. The percentage of software value with respect to hardware will thus go from 60 to 84 percent, the study pointed out.

The situation is very diversified in the market changes for hardware as such.

The market for top of the line mini-computers, as well as that of micro-data processing, should grow by 22 percent per year.

As for the market for conventional mini-computers, its annual growth should be limited to only 6 percent. And finally, the market for universal computers will increase by 14 percent per year between now and 1987.

11,023
CSO: 5500/2358

LEANORD COMPANY INCREASES SHARE OF MICROCOMPUTER MARKET

Paris LES ECHOS in French 14 Sep 82 p 9

[Article by A. V.]

[Text] "The order received from National Education is not a flash in the pan operation for us," as was clearly stated by Bernard Pronier, chief executive officer of Leanord, a French microcomputer manufacturer located in Lille. Indeed, his company received in March, an order for 1100-2200 microcomputers for installation in high schools, as part of the "10,000 micros" operation. A super-boost for Leanord, but not a nostrum, maintains the company's director.

"Such is the market growth, that even if we were not to work again for National Education, we could continue based on our momentum." This order will represent a sale of some 15-20 million francs, while the 1982 turnover will amount to 55-60 million francs (compared to 35 million francs in 1981).

Leanord, which started 22 years ago by designing electronic equipment for laboratories and industry, entered the microprocessing market in 1978, and took a healthy bite. The microcomputer share went from 30 percent of turnover in 1980, to 50 percent in 1981, and will reach about 65 percent in 1982.

Leanord has thus installed 1000 Silex-type microcomputers, and by the end of 1982 should have installed some 2000-2200 Silzed machines (including the National Education ones).

Support from Creusot-Loire

Whether growing in its original sector, or in its adopted market of microprocessing, Leanord has made big strides at an average annual growth rate of 35 percent for the last six years. This has not been without its difficulties. Research and development costs represent 9 percent, and financing costs some 8 percent, of its turnover. And this does not include the provisions necessary for taking into consideration the stock obsolescence risks for some of its product lines. The company thus barely balances its business.

But Leanord has an immense advantage over many PMI (small and medium sized industries), which like it, employ about 100 people.

The company is watched by a careful mother and grandmother: Instrument SA and Creusot-Loire. The group represents 20 percent of Leanord's turnover in 1981, and even as much as 25 percent if one includes the measurement instrumentation at the heart of nuclear power plants, an activity that was the first to establish the image of the Lille firm. And Creusot-Loire, which holds 90 percent of Leanord, does not object to providing it with tonic injections from time to time.

It has for instance provided 1.2-1.4 million francs for the outfitting of a new industrial building in Lille. It is very difficult indeed to be an entirely independent high-performance PMI.

11,023
CSO: 5500/2358

THOMSON'S MT-20 SYSTEM BEGUN IN AMIENS

Paris ELECTRONIQUE ACTUALITES in French 3 Sep 82 pp 1, 7

[Article by D. Levy]

[Text] Amiens--The inauguration of the MT-20 central office in Amiens, on 1 July, had a particular significance for Thomson-CSF. Recognized as fully operational, the TM-20 will now pursue an international career that had already started very well, since between 1979 and 1981 Thomson-CSF had sold 155 centrals in France and 80 centrals abroad (Greece, Iraq, Lebanon, Africa, Chile, and Colombia), for a total of 3.6 million telephone lines. In the presence of some 30 foreign ministers invited to Amiens, Mr Mexandeau, minister of PTT, justified the presence of two French industrial forces in public telephone switching (CGE and Thomson), stating that "rivalry between the two will be encouraged by PTT, even for the development of the new generation of central offices."

On 20 July, the installation of the MT-20 system in Amiens was followed by the placement in service in Iraq, of the first switching exchange of the same type manufactured by Thomson-CSF, thus confirming the operational nature of the product. In addition, the international central office of Athens, operating at 50 percent of its ultimate capacity since the end of 1981, and the central office of Bogota, are being completed. Other MT-20 centrals will begin operating in the coming months, notably in Annecy and Amman.

The first MT-25 units (subscriber exchanges) will be checked during the last quarter of this year, and the first MT-35 exchange will be placed in service at Quilpue (Chile) in mid-1983. These three models of systems of the MT line make it possible to install all types of telephone offices of all capacities.

Revival of Foreign Sales

The Amiens installation is first of all a successful technical wager. Faced with technical difficulties, and under attack by the competition, Thomson-CSF was able to shift the situation in its favor by hiring a sufficient number of technical personnel. The development of the system ultimately required only five years. What other telephone switching system required less time?

Another consequence of the validation of MT-20 in Amiens was the revival of the system's international sales, interrupted in 1980 by the technical difficulties mentioned above.

The production of the MT system has finally entered its full industrial phase. This product represents 75 percent of the workload for Thomson-CSF Telephone plants, with an average weekly production of six MU 320 processors, 35 racks of switching electronics, and 35 racks of subscriber connection units (URA 2G). At the end of this year, production rates will be doubled for the switching units and the URA's. Mass production capabilities will then be about two million lines per year operating under MT systems

Thomson-CSF's public telephone switching arm (7715 employees, of which 1364 are engineers and staff) does a business of 5972 million francs, of which 37 percent in exportation. This year, the division will have a turnover of 2510 million francs, of which 630 million in exportation (25 percent). Of this total, which will increase to 3.5 billion francs in 1983, 70 percent of the turnover will be achieved from MT systems. Lastly, projected orders for this year are 2900 million francs, of which 760 million francs for exportation (26 percent).

A Line of Three Central Offices

These MT-20 automatic switching units, developed since 1977, make it possible to build urban, interurban, and international central offices. Calls are handled by a tandem control unit, composed of two MU 320 processors. The MT-20 connection capacity is 2048 MIC junctions, the control unit can handle up to 500,000 call placements at peak-load hours, and the maximum capacity of the central office is 20,000 erlangs.

For purists, we should point out that the system installed at Amiens is the MT-20 L version, equipped with two 3202 processors. The first cental office in the MT-20 series will be installed in Paris (Bonne Nouvelle). With the MU-320 processor it will have more power, a new technology (ECL instead of TTL-S circuits, 64K memories), and a more economical construction.

The MT-25 subscriber exchanges developed since 1978, have an MT-20 connection network controlled by the same MU-320 processors, equipped with complementary software for handling subscriber needs. The central unit is connected to local or long-distance subscriber connection units (URA), intended for traffic control and transmission adaptation functions. It thus becomes possible to build subscriber exchanges and combined subscriber-switching offices. Each URA allows the connection of a maximum of 1000 subscribers. The maximum capacity of the MT-25 is 65,000 subscribers (10,000 erlangs), and the control unit can process up to 400,000 call attempts at peak-load hours.

The third unit in the MT line, the automatic-switching MT-35, has a totally different design. Intended to meet the needs of subscriber exchanges, or of combined offices with small and intermediate capacities, the MT-35 is build around a basic rack with its own microprocessors-equipped control unit, and a common maintenance rack. This basic rack can service 200-1200 subscribers. The juxtaposition of several units can progressively increase the capacity to as many as 17,000 subscribers (14 racks). The maximum traffic than can then be handled is 2000 erlangs, and the central office can handle up to 100,000 call attempts at peak-load hours. This modularity makes the MT-35's performance very good in urban and suburban zones with small and intermediate loads.

The manufacturing of the MT system components is distributed among various Thomson-CSF plants. The Laval plant is responsible for the MU-320 processors and for the switching electronics racks, the Eu plant produces the URA's, and the Nantes center is responsible for product industrializaton (specific test equipment). The final stage of software writing takes place in Boulogne for systems intended for the French network, and at Nantes Orvault for those destined for foreign markets. The Nantes computer center manages the overall production of the MT system. And finally, the Lannion plant specializes in the fabrication of small production batches.

11,023
CSO: 5500/2358

ALCATEL ELECTRONIQUE SPECIALIZING IN OFFICE TECHNOLOGY

Paris ZERO UN INFORMATIQUE HEBDO in French 20 Sep 82 p 44

[Article by Jean-Louis Cousin: "Alcatel Electronique: A Confirmed Vocation for Office Automation"]

> [Text] Alcatel Electronique went ahead and signed: "It certainly looks now as if office automation will be the main way of our development," Pierre Chavance, president of the group, just stated. After three years of considerable but still tentative efforts in this field, the decision appears firm and final. Obviously, this is a first concrete result of the wishes contained in the Electronic Systems Plan.

Alcatel Electronique--an entity which since 1980 has brought together under a single banner some 15 subsidiaries of CIT Alcatel engaged in private telecommunications, mail processing, computer peripherals and terminals, systems and process-control, and services, i.e. roughly everything but public telephone switching and transmission--has seen its total sales increase by an average of 30 percent per year during the past three years.

In 1982, sales reached 7.2 billion French francs, including 40 percent from export sales. We should note that the total consolidated sales of CIT Alcatel will, for their part, be close to 12 billion French francs.

According to Francois Petit, general manager: "Our office automation equipment is primarily designed for communication." The two officers of the group were addressing the press on the eve of SICOB [International Computer, Communication and Office Organization Show]. After insisting on the keyword of a policy of approach which, on the other hand, is also based on realism, an international perspective and a special research and development effort (500 million French francs in investments), they summarized the four main orientations of the group's operations, with respect both to the results already achieved and to new projects or products.

- Private Data and Telephone Communications Network (companies: Telic, GST [expansion unknown], Intervox and Transac)

As a whole, the private telephone operations progressed regularly, increasing by nearly 20 percent per year during the past 3 years, from 700 to 1,200 million French francs. Telic, which just installed its millionth private telephone line, is launching a new line of automatic switches, the 2505 T, as well as a new small-capacity call-distribution and management exchange, the 2507. The production capacity for videotex has now reached 25,000 units per month. In computer peripherals and terminals, Transac is promising to become the first French computer company, and the third company for data-processing in general (see detailed article below).

- Material and Electronic Mail-Processing (SMH [expansion unknown], Roneo Friden, Satas, CIT transmission department products)

In material mail-processing, the group supplies approximately 15 percent of the world equipment market. At the SICOB, SMH is presenting Alcatel Mail, an addressing microcomputer which marks a new progress in innovation. In addition, the group has already installed 10,000 telex terminals and supplies some 25 percent of the French market for display-screen word-processors (statisticians estimate at 12,000 the total number of units now in operation in France).

For telecopiers, the group claims to supply 30 percent of the domestic market. This year was marked by the simultaneous introduction of three lines of new office automation products: a line of group-3 digital telecopiers, the Alcatel 5200, which includes a dozen of products; the Alcatel 5500 electronic mail distribution system (multifunction multinetwork telecopying); and the 5520 tabletop laser printer.

- Data-Processing Services (GSI [expansion unknown])

Here, the group is betting on data banks. Activities started recently include the distribution by GSI of macro-economic data from the INSEE [National Institute of Statistics and Economic Studies]. In the microform field, it was mentioned that CGA [expansion unknown], for its part, is offering a new document retrieval service...

- Process-Control and Data-Processing Systems (CGA, Sintra, Telci, EVR [expansion unknown], Cilas)

The group is pleased with the success of CGA abroad (43 percent of its sales and 50 percent of its orders), especially with respect to subway and highway toll systems (Hong Kong, United States), and with the success of Sintra in the military sector. All together, this is a very large group employing close to 22,000 people; as we have just seen, its activities go at times very far beyond the limits of office automation (approximately 60 percent of the total) just as, for some activities, office automation far exceeds the limits of the group.

"We do not plan to get into everything, and even in the particular areas where we feel we are competitive, we intend to control our growth. We use our capabilities as a yardstick for our objectives and favor a cautious optimism," Pierre Chavance concluded. That optimism is based on the fact that CIT Alcatel ranks as world leader in time-division switching (9 million lines ordered in 28 countries), is number 2 in mail processing and holds a very strong position on the terminals market, at least at home.

9294
CSO: 5500/2503

MATRA INFORMATIQUE SHOWS FIRST-YEAR GROWTH

Paris ZERO UN INFORMATIQUE HEBDO in French 20 Sep 82 p 44

[Article by F.T.: "Matra Informatique: A Global Approach to Office Automation"]

> [Text] The result of a merger, last January, between Inforex and the computer division of MATRA [Mechanics, Aviation and Traction Company], Matra Informatique should achieve a total sales figure of 275 million French francs during its first year of operation. At the SICOB [International Computer, Communication and Office Organization Show], this company (which distributes the Datapoint line of products) is stressing its global approach to office automation, and especially the local Arcnet network. At the Matra Informatique booth, visitors will also discover two new portable data-acquisition terminals: a small formatable terminal costing about 2,000 French francs, and an alphanumeric terminal that can be programmed in BASIC.

Matra Informatique, created by a merger of the operations of the computer division of MATRA (175 million French francs in sales in 1981, and 1,400 systems installed) and Inforex (65 million French francs in sales and 500 systems installed), is headed by Alain Maurel, a former manager of Inforex France, and employs 340 people.

Its capital is held by the American company Datapoint (49.9 percent), MATRA (49.9 percent), and natural persons (0.2 persons).

Legally, the takeover of Inforex by MATRA (pending official government agreement), should take place before the end of September.

Matra Informatique accounts for over 85 percent of the computer operations of the group; its sales for 1982 are expected to reach 275 million French francs.

By far, most sales (245 million French francs) come from the distribution of Datapoint products (from the small Model-1500 computer with 32 kilobytes of core memory, to the 8800 top-of-the-line model with 1 megabyte of core memory and 1 billion bytes of disk memory).

Since 1978, Matra Informatique has distributed the local Arcnet network, 100 of which have been installed to date.

Arcnet Accepts the TRS-80

Until now, this network was designed for MATRA-Datapoint equipment; it can now accept TRS-80 microcomputers. MATRA and Datapoint are also considering the possibility of connecting MBC [expansion unknown] microcomputers to Arcnet.

The remainder of the sales (30 million French francs) comes from the sale of equipment manufactured by MBC (a direct subsidiary of MATRA), residual Inforex products, the leasing and maintenance of GCS [expansion unknown] data-acquisition equipment, and the sale of portable terminals (from Azurdata).

In addition, Matra Informatique is developing its maintenance activities. The company now owns 28 maintenance centers in France, and 170 of its employees are working in this field. Some 100 of its clients receive the benefit of its software telemaintenance service.

As Alain Maurel, general manager of Matra Informatique, indicated, the company is participating in Datapoint's research and development activities; nevertheless, the French company's contribution still adds little to the value of the American products. Its contribution consists mainly in adding portable terminals.

Datapoint, which is considering building a production plant in Europe, should consider first if it can build it in France where MATRA, one of its main customers, is located.

9294
CSO: 5500/2503

FRANCE PLANS MORE HIGH-TECHNOLOGY TV CHANNELS

Paris SCIENCES ET AVENIR in French Sep 82 pp 28, 30-32, 34

[Article by Laurent Broomhead: "The New Television Channels"]

[Text] A decisive step has been taken toward a new television in France. A fourth channel in 1983, a satellite in 1985. Decisions made during this summer lead to a rapid multiplication of channels. Industrialists are rejoicing because they see a development in their activities. But TV viewers wonder about these preparations: for whom, when, how, and at what price?

The wheels of the new television have started to spin, and the TV viewing public is not even aware that beginning in 1986, its habits will be placed in a turmoil. And France, which today is far behind in the number of available channels, will be a pioneer in the field. The TV images will come to us by cable, and especially directly from satellites. The decision in June, to have a fourth channel which uses the recycled former black and white channel, together with a firm order for a first satellite in mid-July, was enough to start an avalanche of consequences which reach beyond what is merely apparent.

The industrial, economic, and political spinoffs are such that the participants in this audiovisual challenge are not concealing their excitement. Whether at Aerospatiale, which participates in the French satellite program, or at Tele Diffusion de France (TDF), which retains the broadcasting monopoly in France, or at program producers, such as Tele-Luxembourg, the dream is becoming a reality. But what will the changes be for us, the TV viewers? What channels, when, how, and at what price? From a technologic science-fiction gadget we have reached actual daily usage in the near future. What realy is this new television? The French government will offer major options in September, but these are already partially dictated by technology. Let us first remember that there are three ways to broadcast television. Radio waves, with a ground transmitter and individual antennas, exactly as for radio; but for images, one must transmit a thousand times more information each second. Hence the selection of suitable wavelenghts, ultra-short ones in this case. These are the VHF (very high frequency) and UHF (ultra-high frequency, lower than 1 gigahertz) bands, the former for black and white with 819-line images, the latter for the 625-line color images of current sets. But short waves propagate only in a straight line; they do not bounce from the electrified layers of the

atmosphere, as is the case for the longer waves of radio. The range of the transmitters is consequently reduced to the visibility range, and a large number of radio stations had to be installed in France about every 70 km. Some twelve leaps are necessary to cross the country from the Eiffel Tower.

If we had to start all over again today, we would undoubtedly select the direct television satellite, which covers an entire region with radio waves at an even higher frequency, around 12 gigahertz. No more obstacles, no more shadows, but instead, the double requirement of having a powerful satellite in a fixed geostationary orbit above our heads, and antennas on the ground accurately aimed toward it.

The third technique is that of cable, which connects communities (towns, buildings, and so on) to a single distributor. We will see later that satellites and cables are so complementary that one cannot develop without the other. It is of course easy to dream. We picture in our heads future cities invaded with a televideo and telematics information network, and crowned with multiple language satellites. Except that the dream is over ten years old! And the concerned enterprises had no inkling of it, but saw only the intricacies of international politics.

Let us examine for instance, the chronology of a satellite. A first HSat (Heavy Satellite) program is considered in 1976, whose objective is to have Ariane place in orbit in 1979 a joint French-German platform to demonstrate full-time direct television. But Germany now finds out that it has media problems: no direct television program for the time being. Moreover, our neighbor objects to the selection of Aerospatiale as prime contractor. The project is torpedoed, we are told. France hesitates, and then bets on a bilateral formula in 1979: we will have two twin satellites. Aerospatiale and Thomson in France will work together with MBB and AEG-Telefunken on the other bank of the Rhine; in addition, some compensation will be provided to balance the industrial spinoffs from Ariane's success: 54 percent of the industrial returns for Germany and the major portion of the design team. At the same time, France's future is protected, since the integration of the TDF1 satellite is our responsibility, and since we will have access to a reproducible know-how when the time will come to export the principle throughout the world. Political complications again, with the selection of the three programs hypothetically transmitted by TDF1: TF1, TF2, A2, and then what? Why not a Europe 1 television? Its boss, Jean-Luc Lagardere gathers around Matra a communications puzzle of planetary dimensions, and the matter seems closed. But lo and behold, the empire is shattered after 10 May 1981. In the meantime, the other possible private channel, Tele-Luxembourg, had to seek another solution for finding a place in the sky: its own Luxat satellite, for whose fabrication a call for bids has been issued. The competition has started, and for the intermediate-term future the broadcasting monopoly in France is doomed.

But with hindsight, the most extraordinary aspect of all this remains the incredible allocation of frequencies and locations for orbit satellites, resulting from the Geneva conference in 1977. Incredible because the problem would be insoluble today as politically too complex. The consequences of the decisions taken very early, at the dawn of these new technologies, are unbelievable because they are irreversible. We know that the location of satellites in a geostationary orbit is limited for

reasons of wavelength interferences. In 1977, technical constraints (size of Ariane's cone, transmission power of satellites, antenna sensitivity, and so on) had engendered a broad outlook in order to assure that each sovereign state could cover all its territory.

Five years later, we find that the ellipses which delineate the theoretical reception zones largely overlap each other. With a simple 90 cm antenna, or with a stronger, 1.5 m community antenna, and by remaining satisfied with good reception 99 percent of the time, our television becomes a European TV. France covers almost all of it, thanks to the need for servicing Corsica. But the small countries (Luxembourg, Switzerland, Andorra, Monaco, Lichtenstein) hit the jackpot: they gain an unexpected economic potential, a piece of the sky in a way.

The selected broadcasting band extends from 11.7 to 12.5 gigahertz, and is cut into two halves to simplify its management. Each half-band is itself divided into 20 television channels. In addition to the satellite's position, it is possible to choose one of two different signal polarizations (more simply, two ways of broadcasting the radio waves): right-hand or left-hand circular polarization. TDF1 will be located at 19 degrees of longitude west, in the company of the German satellite, and of the eventual satellites of Luxembourg, Switzerland, Austria, Belgium, Holland, Italy, not to mention Benin, Equatorial Guinea, Namibia, Nigeria, and Zaire.

Each country is allocated five channels (France has channels 1, 5, 9, 13, and 17), a beam center (Aubusson), beam angles, an orientation of the ellipse with respect to the equator (160 degrees), a transmission power, and so on. Spain, Great Britain, Ireland, and Portugal will have their satellites further toward the west, at 31 degrees; Andorra, Lichtenstein, Monaco, San Marin, and the Vatican, at 37 degrees. Other antennas will have to be aimed at them in order to receive their signals.

A Second Satellite Will be Needed to Provide Proper Service

Since the end result is a multiplication of channels, let us describe these famous satellites in an attempt to imagine what they promise in the near future. With its 1200 kg in orbit, its 6.4 m height, and its 19 m spread with unfolded solar panels, TDF1 will broadcast three programs.

In fact, since each country is entitled to five space channels, the ultimate goal is to fabricate a five-channel satellite. Actually, TDF1 will have five repeaters on board; a repeater is an electronic black box located between the receiving antenna aimed at the single transmitter anchored on French soil, and the transmission antenna that covers Europe. More specifically, TDF1 will even have six repeaters: one of them will play a double role with possible switching from the ground! All of it in order to model the next generation of satellites, which will have ten repeaters, that is 5 x 2, to broadcast five channels.

But when we say direct television satellite, we imply a significant energy emission from the satellite. Yet, the weight of the solar panels is limited by the weight of the satellite, which is itself limited by the power of the Ariane launcher, or at least by the power that was thought to be available at the beginning of the 1980's. By 1985, Ariane 3 will be in service and will be able to place heavier satellites in

orbit; but TDF1 has a power of only 3 kW, and it would need 5 kW to operate its five channels. The immediate conclusion is that only three of its channels will transmit simultaneously. The others will be redundant and will make it possible to study the configuration of future satellites with 5 kW of electric power on board.

With TDF1, the French public should have a new channel, since TF1 and A2 will use the first two channels, and since the regional assignment of FR3, with its daily region-by-region connections does not allow it to use the satellite. But this is not so, because in truth, TDF1 alone contributes nothing. "We have to make a good distinction between experiment and service," points out Charles Akrich, responsible for Space Affairs at TDF. Public service demands regular broadcasting, and excludes extended major breakdowns.

To begin with, we must observe that the July decision to launch TDF1 in June 1985 (two months after the German version TV-Sat), and granting that an investment loss is out of the question, means that TDF2 must be launched very soon after it. We now have two assured satellites, and arithmetic dictates that 2 x 3 = 6 channels. But this is false reasoning, because on one hand France is entitled to only five satellite channels, and on the other, redundancy is essential in order to guarantee a true three-channel service. We must not forget that this is a world premiere, which does not lack innovations: high on-board power, highly directive and accurately aimed transmission antenna, and progressive wave electronic transmission tubes manufactured by Thomson. An international market is opened at the cost of some risk, even if as we are told by TDF "we made no economies on these satellites in order to assure their reliability."

But we are also told that plans must absolutely be made for a reserve satellite on the ground. And baby makes three! In this technologic machine, TDF1 has its offsprings. Under the circumstances, it is already expected that the third satellite will be of the new generation, with five channels; also heavier, with larger solar panels, a more elaborate cooling system, and the need to use Ariane 3.

All this arithmetical logic comes from the reliability calculations inherent to space projects, in which 100 percent success is rare. We can attempt to deduce a calendar of events: June 1985, launching of TDF1; if the government does decide to move from experiment to operations, launching of TDF2 less than one year later; studies for a five-channel satellite and ordering of a model; and launching of the third satellite if one of the TDF satellites shows signs of weakness, or if the government wants more national channels.

As for programs, after technical tests in 1985 and a "small celebration" probably around Christmas, the first experimental broadcasts should begin in 1986, and service should be established at the end of the same year. By then, the antenna manufacturers will have offered their equipment to the public; they need three years between the time the government reaches a firm decision, and the time they are ready for mass marketing. In the meantime, they wait. And we must not overlook the requirements of integrated circuit research, or the training of installers.

Better Image Quality for All TV Viewers

What advantages can TV viewers expect from all this? First of all, in addition to one more channel, a better image quality: no more echos due to the landscape, or to large buildings in cities. On one hand, the signal comes from above, and on the other, it is frequency modulated and less sensitive to these effects than the current amplitude modulation. The parameters selected guarantee perfect operation for 99.9 percent of the time during the least favorable month of the year! Other advantages are: a signal that is as strong to the north as to the south, since echos are eliminated; no more shadow zones; no more interruptions associated with local transmitter failures; and so on. The French will once more become equal in the television game.

But can we talk of equality when the antenna and electronics assembly which will transform the satellite's 12 gigahertz into the 1 gigahertz of the UHF band, and which will select the channel, is expected to cost about 3000 francs? Can we talk of simplification when the antenna will have to be aimed within one degree, and will have to be steadied against the wind? For the second question, we are told that the small individual antennas (80-90 cm) will present no aiming problems.

The conditions for large collective antennas (1.5 m) will be somewhat more delicate: the larger the antenna, the more accurate must be its aim, and the more secure its foundation. But the problems are shifted from the individual to a collectivity, which is better equipped to deal with them.

The price obstacle might at first sight seem more discouraging, and likely to slow down the development of satellite program reception. In fact, it already appears that the great direct television boom can only be expected from collectivities with large antennas backed by cable networks, independently of whether the cables are coaxial and of the same kind as our present antenna wires, or whether they are optical cables, which industry should begin to develop under the circumstances. Thus television from the sky induces the development of television on the ground, and even of television underground. The success of one depends on the success of the other.

Paradoxically, the price per household is practically identical: about 3000 francs. But for the investment at least, it does not come out of the same pocket. With a collective, the responsibility falls on tele-distributors, who can collect in various ways: either through subscription, or through advertising, or both. For instance, if a network offers ten programs, of which only eight have advertising, one basic rate will be used for these eight programs, with additional payments to be made for the other two, unless they are free public services. In any case, the present financing system through fees will have to be reviewed. TDF will control the tele-distributors, who will be allowed to use private funds from all sources.

Other surprises await the TV viewer in the very near future. Because a satellite is a radical solution, which takes a long time to implement, with its installations of antennas and cables, it was decided to create a fourth channel that can be installed more rapidly. It uses the old 819-line VHF network, which covers 70 percent of the territory, and whose users become fewer every year. Maintaining its structure and gradually changing its electronics and antennas, it will be able to transmit as early as 1983, a 625-line UHF color program in the larger cities, thus paving the

way for the future. For the very long term, we can actualy imagine a redistribution of roles between the ground and the sky: a regional orientation with ground channels and the multiple disconnectable transmitters of the general network; a national, and even international, orientation, with space channels. If to this we add the possibility of very local channels with cable, we become quite aware of the explosive possibilities of television.

Producers Will Have to Devise New Programs

We can nevertheless believe that the satellite will attain a supremacy, since it will offer very attractive technical prospects. As we have seen, the images are frequency modulated, while the sound is digitalized (two million elementary bits of information, 2 megabits, transmitted per second): this results in the announced image, as well as sound, quality. The latter will be excellent not only because of its digital modulation, a system quite similar to the one currently used to obtain high fidelity microgroove discs, but also because it will be readily adapted for stereophonic reception. The image will be accompanied by many coded information bits (Antiope type, subtitling), and by five different sound tracks; why not then commentaries in several languages, or more even more simply, FM radio programs unrelated to the image, but transmitted concurrently for free, and received with high technical quality. The electronic box located near the TV set will decode it all. It is up to producers to feed these individual supports, and to devise new programs.

And that is so because the five French channels of 1986 should rapidly be joined by foreign channels, thanks to the small miracle of the 1977 channel allocation.

Let use examine for instance the point of view of our Luxembourg neighbors. As all other sovereign states, Luxembourg was allocated five channels that cover a large ellipse, which in turn includes a good portion of France, and even all of it if we add cable networks to individual antennas. The moment of euphoria in which the Luxembourg Television Company (CLT) had hoped to be the first in the world with its own satellite, was followed by a waiting period. Why be the first one in the water? And since cable must develop in parallel for the project to be successful, the impact of the French satellite becomes indispensible. By the same token, too much delay is also undesirable. Yet the manufacturing delay is four years, three of them for the satellite, six months before for selecting options, and six months after for implementation. Consequently, Luxembourg will decide about its satellite immediately after the French government itself reaches a firm decision, that is, before the end of the year.

The reason for this quasi-certainty, which adds one more gear in the French clockworks, lies in Luxembourg's economic situation. While the steel industry is on the decline, CLT is the country's largest taxpayer. RTL, the radio network, has reached its maturity--highly successful, to be sure--the peak of the curve, and is beginnig to level off. Television, which today covers only three French departments, becomes essential for CLT and therefore for Luxembourg.

To the French language channel, it will add a channel in German, and maybe a program divided between English and Dutch. The driving force for development is advertising, of course; but we can imagine the investment represented by this operation. The number of broadcasting hours to be provided is such that the price of the satellite itself will be secondary.

Still, the unanswered question is what programs will all these satellites transmit? Service TV, films, or subscription TV for the fourth French channel? Commercial programs on private channels? Because the field to be explored is so vast, everything is possible, and everything will probably happen.

France retains some of the decisions in its own hands, but not all of them. As we were told by Tele-Luxembourg, the French government would be mistaken to worry about its neighbor, since RTL has always been a good French language vector, and especially since one of CLT's stockholders is France, through the Havas agency, in which the government has a majority interest. Without wandering through the complex labyrinth of economic relations, let us simply indicate that CLT's advertising management, Informations et Publicite, is a 95 percent subsidiary of Havas.

While the French satellite will also cover North Africa, Spain, and Italy, as well as part of England, Germany, Switzerland, and so on, we will also someday undoubtedly receive images from Telsat, the Swiss satellite, not to mention all the possible deals among small countries and large companies, and not overlooking the fact that with another antenna we can plug into England.

The consequences are very important for our satellite and cable industries, which in addition to the domestic market will have, for foreign sales, the advantage of having been the pioneers. This is the real reason for France's involvement in the field, added to which is the rather morose political climate in which occasions for entertainment, or promises for new amusements, are not so numerous.

Caption: Beginning in 1986, antennas of this type will be aimed at the TDF1 satellite, and later at the Luxembourg satellite.

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CSO: 5500/2357

BRIEFS

MATRA SPACE IN MEXICO--Matra Space should record a business growth of 30 percent amounting to more than 900 million francs. The firm is negotiating in Mexico for the delivery of two communication satellites of the OTS family, the Marecs and Telecom. It is working on ten large space programs. [Text] [Paris LES ECHOS in French 13 Sep 82 p 12] 11,023

BIARRITZ FIBER OPTICS--Responding to a question raised by Mr Noir, representative from Rhone, Mr. Mexandeau, PTT minister, indicated that more than 300 million francs have already been committed to the program for optical fiber cable installation in the city of Biarritz, as part of a total cost which should amount to 500 million francs, so as to assure the beginning of tests in 1983. Part of the funds have been committed to civil engineering work which would have been necessary in any case to modernize the Biarritz telephone network lines. For this program, as well as for the direct broadcast satellite program, it was specified that predominance should be given to the part allocated for studies corresponding to investments designed to acquire and demonstrate industrial know-how. The sums quoted above can therefore be validly assessed and compared only in terms of the markets expected for the technologies considered. [Excerpt] [Paris ELECTRONIQUE ACTUALITES in French 10 Sep 82 p 10] 11,023

DATA PROCESSING GROWS 22 PERCENT--The SFIB (French Union of Informatics and Office Equipment Manufacturers) annual report announces a 22 percent growth in the French data processing equipment inventory, which on 1 January 1982 reached 115,128 machines (against 94,075 in 1981), despite a general reduction in investments. This growth was felt especially in terms of very small systems (50,000-250,000 francs), with a 17 percent growth, and surprisingly, even more so in favor of small systems (250,000-1,600,000 francs), with a growth of 37.75 percent. On the other hand, the markets for intermediate (1.6-7.0 million francs) and large (more than 7 million francs) computers, seem to be growing once more after a quasi-stagnation (with respectively 13.6 percent against 0.1 percent, and 5.90 percent against 4 percent, in 1980). At the same time, the valuation of this inventory is quasi-stagnant in terms of machine values. It is regrettable that the study does not take into account the market in full expansion, of machines that cost less than 50,000 francs, despite the fact that these systems are more powerful than those classified in a higher category several years ago. A technologic evolution is taking place, that is difficult to assess in terms of cost/performance ratios. What is more, this classification is itself questionable, notably at the level of small systems costing 250,000-1,600,000 francs, which combine minicomputers and small universal computers. This classification should be reconsidered in order to better reflect the changes in the market. [Text] [Paris ELECTRONIQUE ACTUALITES in French 3 Sep 82 p 6] 11,023

TELEVISION CABLE LINKS FOR SHORT DISTANCES DESCRIBED

Turin ELETTRONICA E TELECOMUNICAZIONI in Italian May-Jun 82 pp 107-114

[Article by Giorgio Arena and Giorgio Garazzino*: "Urban Television Connections of RAI (Italian Radio Broadcasting and Television Company) in Coaxial Cable"]

[Text] Summary--Television cable links for short distances. The RAI has since some time ago implemented several coaxial-cable television links for short distances between its TV studios and the relevant transmitting centers, as well as between studios and the urban fringe sites, where television shootings of news events are more frequently carried out. This paper examines first the characteristics of the 2.6/9.5-mm cable used. A brief description of the various systems for cable transmission of analog television signals follows: directly in baseband, by means of frequency-division multiplex, by amplitude- or frequency-modulated carriers. The RAI has chosen the last system because of the advantages with respect to the previous ones. The RAI Research Center has designed and implemented three types of links: a link with a 20-MHz double-sideband amplitude-modulated carrier; a link with a 40-MHz frequency-modulated carrier and a link with a 70-MHz frequency-modulated carrier. These systems can be combined in the same cable, and using the 2.6/9.5 cable, three simultaneous TV signals up to a 3,300-m distance, or two simultaneous TV signals up to a 6,500-m distance, can be transmitted. The basic characteristic of these links is the absence of intermediate repeaters. Some considerations are then made on the coaxial-cable equalization, aiming at reducing the distortions generated on the video signals. Finally, the results of video measurements made on links with two or three simultaneous TV signals are indicated.

1. Introduction

From the beginning of the public television service, assigned to the RAI, there was the need to connect the studios of the TV production centers both with their own transmitting centers and with the points, situated in a radius of a few kilometers within the urban area, at which it is very often necessary to do television reports of current events in politics, sports, entertainment, etc.

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* Giorgio Arena, p.i. [expansion unknown] Giorgio Garazzino of the RAI Research Center, Turin.

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For this purpose, coaxial-cable connection was decided on and cables were laid, first in Rome and Milan, and subsequently in other localities in Italy, so that the present situation thus came about.

In particular, the most complex network of connections is that of Rome. It enables the TV Production Center to transmit and receive television signals to and from several points in the urban area. These points are the most important sites of Italian political activity (Palazzo del Quirinale, Palazzo Madama, Montecitorio, Palazzo Chigi), Vatican City, the RAI departments, the Foro Italico (and the contiguous Olympic Stadium and Aquatic Stadium), the Teatro delle Vittorie, and finally, the Transmitting Center of Monte Mario.

By means of the chain of fixed radio bridges, through Monte Mario, both the national television connections (with the other transmitting centers and the RAI regional headquarters) and the international ones are achieved.

The Rome network is made up of numerous runs of coaxial cable, the length of which varies from a few 10's of meters to about 6,500 meters.

The coaxial-cable connection has been preferred to the radio bridge inasmuch as--though it has the disadvantage of higher initial cost (attributable largely to the expense of laying it)--cable nevertheless offers the important advantages of being immune to interferences (an especially important merit in big cities, where the crowding of the airwaves is at a maximum), of making abusive reception of the signal practically impossible, and of not requiring line-of-sight locations for achieving the connections.

The RAI Research Center was from the beginning assigned responsibility for solving this problem, as regards both the choice of the system and the designing and realization of the equipment. The original solutions adopted have proven valid with time and have always permitted service of high reliability and with the required quality.

The transmission system currently used is that of frequency-modulated carriers or double-sideband amplitude-modulated carriers.

This system--chosen for the many advantages it offers over the others--was arrived at after initial experimentation with transmission methods similar to those described below; it is sufficient to cite at this point, for example, transmission of the television signal directly in baseband, or by means of a carrier at 18, 35 or 50 MHz, single-sideband or vestigial-sideband amplitude-modulated.

Reasons of construction and operation simplicity of the equipment, flexibility of installation, quality of video signal received and containment of signal attenuation on the longest connections then convinced RAI to adopt solely the double-sideband amplitude-modulated 20-MHz carrier. A fundamental condition was that of not requiring intermediate repeaters, both for simplicity of installation and, especially, because in some cases the insertion of repeaters would have proven expensive and complex.

Subsequently, the need to increase the number of connections without laying new cables, together with the practical possibility resulting from technological development, led to the introduction of the 70-MHz system and subsequently the 40-MHz system, both frequency-modulated.

2. Characteristics of the Coaxial Cable

For the television-connections network, the so-called "national" cable was adopted, composed of four 2.6/9.5 coaxial monotubes, with impedance characteristic of 75 ohms, and a certain number of telephone pairs and quads. Figure 1 presents a cross-section of the cable structure.

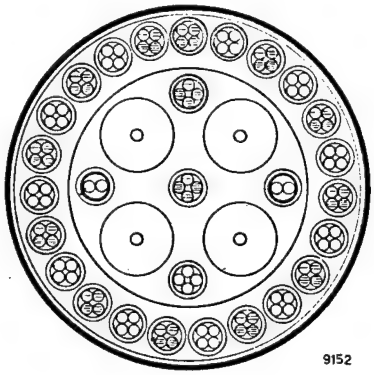


Figure 1. Cross-section of the "national" coaxial cable adopted for the RAI television connections

Figure 2 presents the kilometric attenuation characteristic in function of frequency at cable temperature of +10 °C. The curve was obtained by means of the formula (Bibliography 1):

[1] $$A = a\sqrt{f} + bf$$

in which A is the kilometric attenuation (in dB/km), f is the frequency (in MHz), and a and b are two constants dependent on the parameters of the cable. For the 2.6/9.5-mm "national" cable, the manufacturer gives the values $a = 2.3365$, $b = 0.00608$.

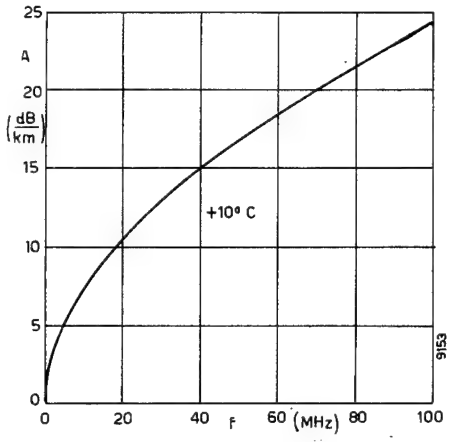
The attenuation depends also on the temperature of the coaxial cable, which, though buried, feels thermal variations, essentially seasonal ones, though to a limited extent vis-a-vis the outside.

Introducing the "temperature" variable (t in °C) and ignoring the term bf, [1] becomes:

[2] $$A = a\sqrt{f}[1 + K(t - 10)]$$

in which $K = 0.0021$, as results from Bibliography 1.

Figure 2. Kilometric attenuation A of 2.6/9.5 coaxial cable in function of frequency f, at temperature of 10 °C.



3. Transmission of Television Signals in Coaxial Cable

There are various techniques suitable for transmitting television signals to some distance by means of coaxial cable. Excluding the digital techniques, in view of the fact that digital television is still in the experimental stage, the television signal can be transmitted in coaxial cable either directly in baseband or by modulating a radio-frequency carrier.

In this second case, moreover, if there should be more than one signal to transmit, either a system of frequency-division multiplex type, of telephonic derivation, can be used, or else a number of independent carriers, amplitude-modulated or frequency-modulated. The choice of the most suitable system is determined by the characteristics of the connection--among which, for example, are its length, the number of signals and the quality required--and by the evaluations of the cost and complexity of the installations.

3.1. Baseband Transmission

Baseband transmission of television signals in coaxial cable has a prime and important limitation, consisting in the fact that only one signal can transit on each cable.

Secondly, this solution is advisable only in the case of connections of moderate length. Indeed, as can be noted from Figure 2, in the case of 2.6/9.5-mm cable, the attenuation difference between the lower and upper extremes of the video-frequency band (0 - 55 MHz) is considerable and is proportionate to the length of the cable. It is therefore necessary to insert equalizers for the purpose of restoring, at the end of the cable, the correct levels of the video components at the various frequencies.

In addition, as was said, the cable's attenuation varies with its temperature, and it emerges from [2] that the variation is greater as the frequency of the signal is higher. It follows from this that in the case of cables in an ex-

ternal environment, even if buried, the baseband equalization has to be adjusted periodically so as to compensate for the thermal variations. Correct equalization therefore proves to be a critical matter.

Disturbances constitute another difficulty; they are generated by discharge currents between two points on the shielding of the coaxial cable, by atmospheric discharges, etc. Or they are produced by electromotive forces induced by alternated electromagnetic fields, usually at the network frequency or its harmonics, in relation to which, up to frequencies of several 10's of kilohertz, the protection offered by the coaxial cable is minimal.

In order to reduce these disturbances as much as possible, appropriate methods must be used, among which are special balancing systems and the use of "clamp" circuits for alignment of the synchronisms of the television signal.

All these systems have been broadly experimented with by RAI, but have not produced sufficient reliability in time.

3.2. Transmission by Means of Frequency-Division Multiplex

In several countries, coaxial-cable connections have been made by which it is possible to transmit 10,800 telephone channels, or 6 television channels, or a combination of TV and telephone channels, using the 60-MHz frequency-division multiplex system (Bibliography 2, 3, 4).

In such a system,[1] each television channel, with video-bandwidth of 6 MHz, does vestigial-sideband amplitude modulation of a carrier at about 12 MHz.

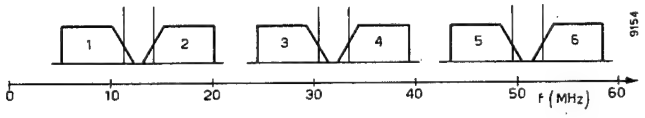


Figure 3. Example of allocation in band up to 60 MHz of six television channels transmitted on coaxial cable with the frequency-division multiplex system

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The six channels are then allocated to different frequencies in the 60-MHz band, as is represented in Figure 3, in which it can also be noted that, starting from the lowest frequencies, the six channels alternately conserve the lower sideband or the upper sideband.

In order to minimize the mutual interferences among the six television channels, caused by the intermodulation products, it is advisable to correlate the frequencies of all the carriers.

For the same reason, the spacing between the channels should be selected with care. Since good quality has to be ensured for the signals detected and since it is sometimes appropriate to use modulation depths greater than 100 percent, synchronous demodulators are used; at the reception end, circuits are therefore necessary for regeneration of the carriers, either derived from the signal re-

ceived or by means of oscillators hooked up in phase to the carriers by means of a pilot.

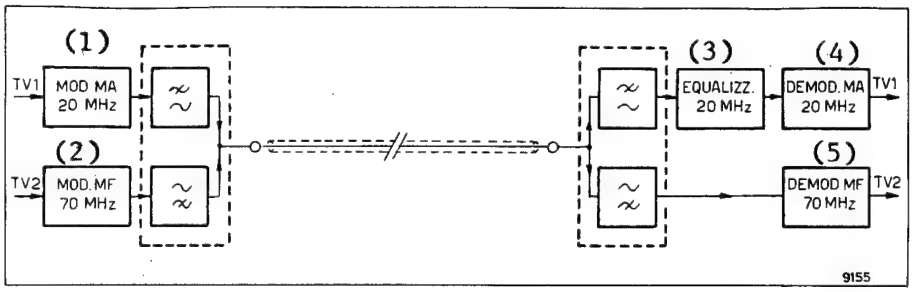

Figure 4. System for transmission of two television signals on 2.6/9.5 coaxial cable of length not greater than 3,600 meters.

Key:

1. AM modulator
2. FM modulator
3. Equalizer
4. AM demodulator
5. FM demodulator

Also at the reception end, for each TV channel there is a certain number of equalizers of the group delay produced by the channel filters, by the vestigial band cutoff, etc.

The length of the connections in which the 60-MHz system is used can reach several hundred kilometers. The need to insert a large number of repeater amplifiers at a regular distance from one another (about 1,500 meters) is therefore obvious.

They also provide for amplitude-equalization of each length of cable. Adjustments of amplification and of equalization--necessary especially because of large thermal variations--are automatic and are commanded by thermistors and by amplitude detectors for pilot carriers provided for the purpose.

The system described proves inadequate for television connections of just a few kilometers, especially because of the considerable complexity of the equipment and the necessity of intermediate repeaters.

3.3. Transmission by Means of Amplitude-Modulated or Frequency-Modulated Carriers

On RAI's coaxial-cable television network, the technique has been adopted that uses several carriers at different frequency, so as to be able to transmit several signals on each individual cable. More precisely, a 20-MHz carrier is modulated by an initial television signal, while another carrier, at 70 MHz but frequency-modulated, transfers a second signal.

In addition, a connection was recently made with a 40-MHz carrier, also frequency-modulated, making it possible to insert a third television signal, still on the same cable.

In future, when the 40-MHz system has become operative, the television connections on a single coaxial cable will be made in accordance with the block configurations of Figures 4, 5 and 6, which apply, respectively, to lengths of "national" cable not longer than about 3,600, 3,300 and 6,500 meters.

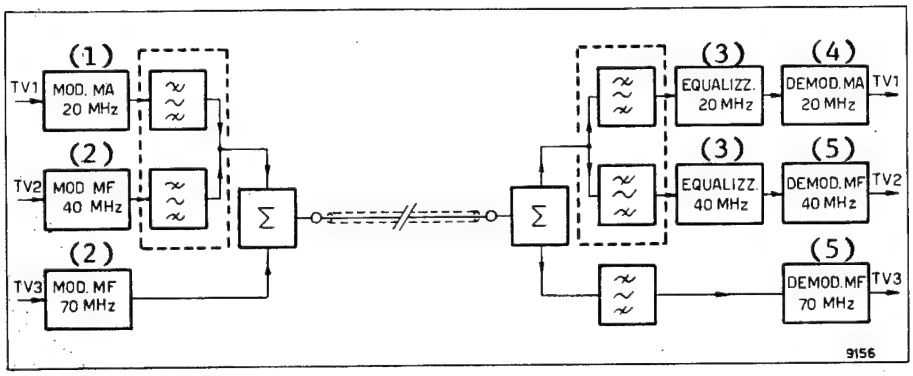

Figure 5. System for transmission of three television signals on 2.6/9.5 coaxial cable of length not greater than 3,300 meters

Key:

1. AM modulator
2. FM modulator
3. Equalizer
4. AM demodulator
5. FM demodulator

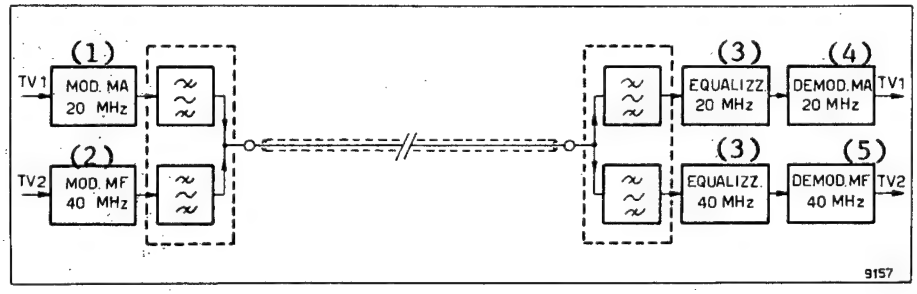

Figure 6. System for transmission of two television signals on 2.6/9.5 coaxial cable of length not greater than 6,500 meters

Key:

1. AM modulator
2. FM modulator
3. Equalizer
4. AM demodulator
5. FM demodulator

In the system in Figure 4 for two TV signals, the maximum length of the connection is limited by the 70-MHz signal. At that frequency, the attenuation of 3,600 meters of 2.6/9.5-mm cable is about 72 dB, and the insertion loss of the combiners-separators of the 20-MHz and 70-MHz signals (constituted by low-pass and high-pass filters that do not require group-delay equalization) is about 1 dB each, while the output level of the 70-MHz modulator is 1 volt and the maximum sensitivity of the demodulator is 0.2 mV, with an unweighted video S/N [signal-to-noise] ratio of 47 dB[2] (maximum interposed attenuation: 74 dB).

In the block diagram of Figure 5, for three TV signals, combiner-separators of the 20-MHz and 40-MHz signals are used (composed of bandpass filters provided

with group-delay equalizers), as well as hybrid-type combiner-separators which, in transmission, provide for adding the 70-MHz signal to the preceding two.

In reception, since such hybrids are not selective, it is necessary to insert also a 70-MHz bandpass filter in order to keep the 20-MHz and 40-MHz signals from reaching the input of the 70-MHz FM demodulator: part of the harmonics that would be created, falling into the 70-MHz band, would appear in the form of disturbance of the demodulated video signal.

The insertion loss of the two hybrids (about 3 dB each) and of the bandpass filter has the effect that in this case the length of the connection, still tied to the 70-MHz signal, may not exceed 3,300 meters.

Finally, the third system, with two TV signals transmitted (Figure 6), is dimensioned for connections up to 6,500 meters.

It will be noted that the use of repeater amplifiers is not required, not even on the connections of maximum length.

The 20-MHz carrier uses double-sideband amplitude modulation, with positive-modulation reverse (or the maximum and minimum peak-to-peak amplitudes of the modulated signal correspond, respectively, to the level of the white and to the level of synchronism of the video signal) and modulation depth of about 70 percent.

The frequency of the 70-MHz carrier was chosen inasmuch as it coincides with the intermediate frequency of the television radio bridges, all of whose frequency-modulation characteristics were also adopted. A double advantage derives from this: apparatuses of a single type are used indifferently on the coaxial-cable or radio-bridge connections; and it is possible to combine at an intermediate frequency--therefore without baseband demodulation and remodulation--cable connections and radio-bridge connections, or vice-versa.

The 40-MHz and 70-MHz modems are capable of musical audio channel in supervideo, with frequency-modulated 7.5-MHz subcarrier.

In future it will be possible to transmit up to six music channels using a digital system with time-division multiplex and 4ΦPSK modulation, at 2,048 Mbit/s, of the 7.5-MHz subcarrier.

Figure 7 represents the frequency spectrum relative to the three modulated carriers considered previously.

The variations in cable attenuation caused by seasonally wide heat variations do not have any practical consequence for the frequency-modulation connections, thanks to the preamplifiers with automatic gain control and the limiters.

On the amplitude-modulation connection, though, the compensation is done manually.

Any eventual low-frequency and periodic disturbances induced in the coaxial cable, being outside the bands occupied by the radio-frequency signals, are eliminated by the combiner-separators and by the selective circuits of the apparatuses.

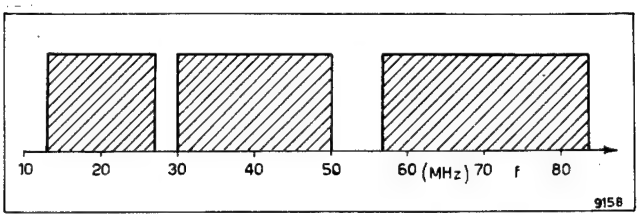

Figure 7. Frequency spectrum of the system for coaxial-cable transmission of three television signals by means of amplitude-modulated or frequency-modulated carriers.

4. Equalization of the Coaxial Cable

After tranist in unequalized coaxial cable, the video signals transmitted by means of amplitude-modulated or frequency-modulated carriers are affected by distortions.

As is known, and as has been verified experimentally, in the frequency range in which the systems under consideration are involved, above 10 MHz, coaxial cable presents a nearly constant group-delay characteristic and therefore it does not introduce appreciable phase distortions. Thus the distortions undergone by the video signals are attributable mainly to the course of the frequency-attenuation characteristic, as shown in Figure 2.

The attenuation curve of the cable in the frequency band involved around the carrier of each signal can be considered as the sum of two curves (see Appendix): the first is a straight line and produces, vis-a-vis the carrier, a heightening of the lower sidebands and attenuation of the upper sidebands, in all the more intense a manner as the carrier gets farther away, or the higher the frequency of the modulating signal is.

In double-sideband amplitude modulation, quadrature distortion results, while a frequency-modulated signal will be affected by amplitude modulation, at the rhythm of the modulating signal, in a degree proportionate to how high the frequency of the modulating signal is.

In reception, in the limiter stages of the FM demodulator the parasite amplitude modulation could be converted into phase modulation; and it is therefore essential for the limiters to be made in such a way as to reduce as much as possible the rate of conversion of amplitude modulation into phase modulation.

The second component of the attenuation curve in the frequency band involved is, however, a parabola turned downward and symmetrical vis-a-vis the frequency of the carrier. It produces a heightening of both of the modulation sidebands. This heightening is greater as the carrier gets farther away, and therefore as

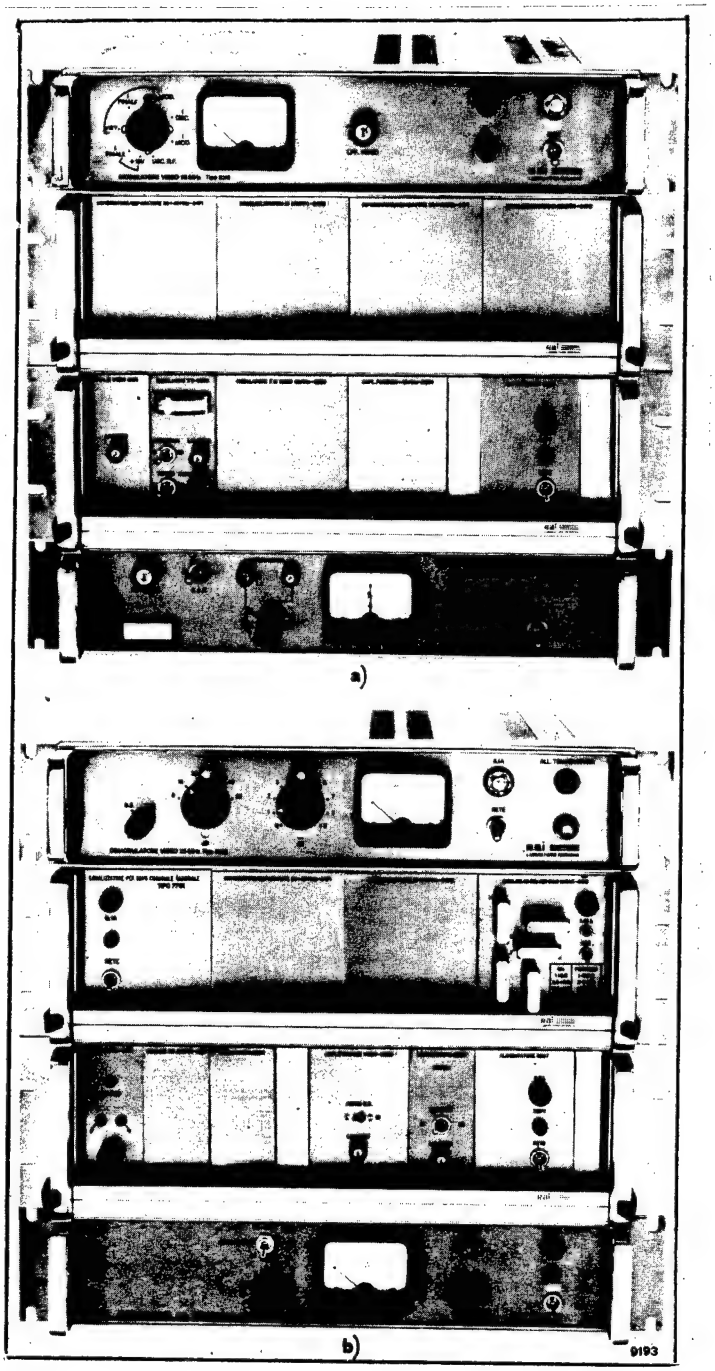

Figure 8. Transmission (a) and reception (b) equipment designed and built by the RAI Research Center for short coaxial-cable television connections.

a) From top to bottom: 20-MHz AM modulator; combining unit; 40-MHz FM modulator; 70-MHz FM modulator.

b) From top to bottom: 20-MHz AM demodulator; unit formed by the separation filters and the equalizers; 40-MHz FM demodulator; 70-MHz FM demodulator.

as the frequency of the modulating signal is higher. From this there derives, for both types of modulation, a heightening of the baseband components that increases with the frequency.

It has been learned experimentally that this type of distortion becomes no longer negligible on 20-MHz amplitude-modulation connections of length more than 1 km, while on the 40-MHz and 70-MHz frequency-modulation connections the limit jumps to 2.5 km and about 3.5 km, respectively.

At 70 MHz, the limit length is greater by comparison with 40 MHz, inasmuch as the band occupied is, percentage-wise, lower than the carrier, and in addition, the attenuation characteristic of the cable (Figure 2) tends to be increasingly linear with the increase of frequency.

Apart from these lengths, it is necessary to insert amplitude equalizers which, in the frequency band used, present an amplitude-frequency characteristic complementary to that of the coaxial cable.

Two different types of equalizer, at the frequencies of 20 MHz and 40 MHz, inserted in reception, as is shown by the block diagrams of Figures 4, 5 and 6, have therefore been designed and built by the RAI Research Center. Both types are adjustable at intervals of every 1,000 meters, in function of the length of the cable run to be equalized.

It should be kept in mind that the 40-MHz equalizers are inserted also on the connections less than 2,500 meters long--although, as was said, they are not indispensable in these cases--in order to unify the structure of the installations and minimize the distortions in any condition.

It is important to note that with double-sideband amploitude modulation there is a compensation effect between the two modulation sidebands (one heightened, the other attenuated) that does not, however, occur with the vestigial-sideband modulation used in the frequency-division multiplex system illustrated previously.

This last-named system thus presents cable-equalization requirements that are quite a bit greater and more critical than the double-sideband system.

Figure 8 shows the 20-, 40- and 70-MHz devices designed and built by the RAI Research Center for transmission and reception of television signals on short coaxial-cable connections.

5. Measurements on the Connections

Among the connections represented in Figures 4, 5 and 6, the most critical is obviously the one in which three video signals transit simultaneously in a single cable (Figure 5). An experimental connection of this type was therefore selected, 2,882 meters long, for doing video measurements on each of the three signals (Bibliography 6).

In addition, the performance characteristics of the 6,127-meter--very close, therefore, to the maximum length--double simultaneous system (Figure 6) were verified (Bibliography 7).

The measurements were made by the use of an ITS (Insertion Test Signals) generator in transmission and an automatic video measuring instrument in reception. The results obtained in the two cases, purged of the distortions from the video generator itself, are brought together in Tables 1 and 2.

Table 1--Results of Video Measurements Made with Triple Simultaneous Connection in Cable (2,882 Meters)

		20 MHz	40 MHz	70 MHz
Bar amplitude	(%)	8*	1	3
Amplitude of synchronisms	(%)	1	1	3
Bar tilt	(%)	-0.2	-0.1	-0.1
Baseline distortion	(%)	-0.2	0.2	-0.6
2T/bar ratio	(%)	1	1	-1
Chrominance/luminance ratio	(%)	0	3	-4
Differential gain (+ x)	(%)	0	-1	0
Differential gain (- y)	(%)	-5	-2	-1
C/L intermodulation	(%)	-1	0	0
Chrominance nonlinearity	(%)	0	1	3
Static nonlinearity	(%)	5	1	0
Differential phase	(°)	0	1	1
Chrominance/luminance delay	(ns)	30	30	40
Low-frequency errors	(%)	2	1	1
S/N ratio (unweighted)	(dB)	55	58	59

* Adjustment of level on the demodulator can be done at 1-dB intervals.

It should be stressed that the 20-MHz and 70-MHz devices used in the course of the abovementioned measurements have been in service for several years and were not overhauled beforehand, while the 40-MHz connection was at the prototype stage and undergoing experimentation.

It should be noted that the connections as planned for practical use (block diagrams of Figures 4, 5 and 6) are of unidirectional type--that is, all the various signals of the same connection are transmitted from the same end of the cable and go through it in the same direction.

However, the practical possibility of connections of bidirectional type, such as may prove necessary in emergency situations, has been verified, and it has been ascertained that it is possible to transmit the 20-MHz and 40-MHz signals in one direction and the 70-MHz signal in the opposite direction.

In such case, the length of the cable must not exceed 3,000 meters.

Table 2--Results of Video Measurements Made with Double Simultaneous Connection in Cable (6,127 Meters)

		20 MHz	40 MHz
Bar amplitude	(%)	2	0
Synchronism amplitude	(%)	-6	1
Bar tilt	(%)	0	-0.1
Baseline distortion	(%)	-0.5	0.2
2T/bar ratio	(%)	0	3
Chrominance/luminance ratio	(%)	-2	6
Differential gain (+ x)	(%)	1	2
Differential gain (- y)	(%)	-2	0
C/L intermodulation	(%)	0	0
Chrominance nonlinearity	(%)	0	2
Static nonlinearity	(%)	3	3
Differential phase	(°)	0	1
Chrominance/luminance delay	(ns)	30	-10
Low-frequency errors	(%)	2	2
S/N ratio (unweighted)	(dB)	48	51

6. Conclusions

The RAI network of short-distance television connections in coaxial cable currently fulfills its tasks in an adequate manner.

The system adopted of single carriers, frequency-modulated or double-sideband amplitude-modulated, has been preferred to other systems (for example, baseband transmission, frequency-division multiplex) because of the advantages it offers in its application to the RAI television network and that can be summarized as follows:

--simultaneous transmission of several different television signals (in practice, up to three) in a single cable and in the same direction;

--rather simple apparatuses and installations, therefore reliable and requiring minimal maintenance;

--amplitude-equalization of the cable on the 20-MHz and 40-MHz connections, not particularly complex (for example, adjustment at intervals of every 1,000 meters) and does not require compensation for the thermal variations of the cable. All this by virtue of adoption of double-sideband amplitude modulation or of frequency modulation;

--absence of cable equalization on the frequency-modulation 70-MHz connections, within the framework of the distance considered;

--nonexistence of intermodulation between the television channels;

--use of the same type of 70-MHz FM modem for the connections in coaxial cable and by television radio bridge;

--good immunity to disturbances and consequent absence of antidisturbance devices;

--absence of amplifiers and equalizers along the cable;

--group-delay equalizers decidedly simpler than those necessary for the vestigial-band amplitude-modulation multiplex systems; indeed, they exist only in the combiner-separator filters for the 20-MHz and 40-MHz signals;

--on connections not longer than 3 km in length, possibility of simultaneous transmission of two TV signals in one direction and one in the opposite direction in cable.

Thanks to the cable network, a large number of television reports arrive at the TV Production Centers daily, and others are transmitted from the centers, providing the necessary video-signal quality.

When the television-traffic capacity is increased by adding to the present 20-MHz (amplitude-modulation) and 70-MHz (frequency-modulation) connections the new 40-MHz connections (also amplitude-modulation), the possibility of transmitting one more television signal on each coaxial cable will greatly reduce the difficulties that can now arise when important current events occur at the same time.

If and when, however, it should be necessary to further increase the number of connections (and excluding recourse to the frequency-division multiplex systems for reasons of the complexity and high cost of the installations and the low flexibility of use of the system), the only solution to adopt would be the laying of more coaxial cables or--even better--optical fibers.

For various reasons, optical fibers are indeed destined to supplant metallic cable in the future. The main reason is the larger number of connections that optical fibers make possible, because, among other things, it is possible, with equal outside diameter, to put a far higher number of optical fibers together than with metal coaxial cable. Finally, the complete immunity of optical fibers to electromagnetic interferences and to the currents traveling in the ground should not be forgotten.

Appendix

The kilometric-attenuation curve of a coaxial cable in function of frequency is given by the equation:

[1] $$A = a\sqrt{f} + bf$$

in which A = kilometric attenuation (dB/km), f = frequency (MHz), and a and b are constants and dependent on the diameter of the cable.

For 2.6/9.5-mm cable, one has: a = 2.3365, b = 0.00608.

It is desired to approximate this curve with the sum of two other functions y_1 and y_2 such that:

[2] $$A \cong y_1 + y_2$$

in which:

[3] $$y_1 = \alpha f + \beta$$

is a straight line and

[4] $$y_2 = \gamma f^2 + \delta f + \varepsilon$$

is a parabola with its concave part downward.

This approximation has to be valid in the frequency intervals:

$$f_o - \Delta f_o \leq f \leq f_o + \Delta f_o$$

corresponding, in the three cases considered, to the values:

[5] $f_{o1} = 20$ MHz, $\Delta f_{o1} = 7$ MHz,

[6] $f_{o2} = 40$ MHz, $\Delta f_{o2} = 8$ MHz,

[7] $f_{o3} = 70$ MHz, $\Delta f_{o3} = 10$ MHz.

In addition, it is desired that the vertex of the abscissa of the parabola be f_o. The vertex of the parabola is the maximum point of the function y_2 and therefore has a nil prime derivative; therefore:

$$y_2' = 2\gamma f + \delta$$

$$y'_2(f_o) = 2\ \gamma f_o + \delta = 0 \qquad \text{or} \qquad \delta = -2\gamma f_o .$$

The equation for the parabola thus takes the form:

[8] $$y_2 = \gamma f^2 - 2\gamma f_o f + \varepsilon .$$

The function sought will therefore be:

$$y_1 + y_2 = \alpha f + \beta + \gamma f^2 - 2\gamma f_o f + \varepsilon$$

$$y_1 + y_2 = \gamma f^2 + (\alpha - 2\gamma f_o) f + (\beta + \varepsilon);$$

putting $\eta = \alpha - 2\gamma f_o$ and $\lambda = \beta + \varepsilon$ one has:

[9] $$y_1 + y_2 = \gamma f^2 + \eta f + \lambda$$

The problem now becomes to find for each of the frequency intervals [5], [6], [7] the coefficients γ, η, λ of the second-degree polynomial [9] that best approximate the function given [1]. These coefficients were obtained with the POLFIT [expansion unknown] optimization method available on CMS [expansion unknown] base (Bibliography 8).

By selecting from among all the possible parallel straight lines having as angular coefficient α the one passing through the origin ($\beta = 0$ and therefore $\lambda = \varepsilon$), the following values are obtained for the three intervals:

$$f_{o1} = 20 \text{ MHz} \qquad \Delta f_{o1} = 7 \text{ MHz}$$
$$\gamma_1 = -0{,}3387 \cdot 10^{-2} \qquad \alpha_1 = 0{,}2700$$
$$\eta_1 = 0{,}4055 \qquad \delta_1 = 0{,}1355$$
$$\varepsilon_1 = \lambda_1 = 3{,}817$$

$$f_{o2} = 40 \text{ MHz} \qquad \Delta f_{o2} = 8 \text{ MHz}$$
$$\gamma_2 = -0{,}1168 \cdot 10^{-2} \qquad \alpha_2 = 0{,}1914$$
$$\eta_2 = 0{,}2848 \qquad \delta_2 = 0{,}9343 \cdot 10^{-1}$$
$$\varepsilon_2 = \lambda_2 = 5{,}496$$

$$f_{o3} = 70 \text{ MHz} \qquad \Delta f_{o3} = 10 \text{ MHz}$$
$$\gamma_3 = -0{,}5016 \cdot 10^{-3} \qquad \alpha_3 = 0{,}1459$$
$$\eta_3 = 0{,}2162 \qquad \delta_3 = 0{,}7023 \cdot 10^{-1}$$
$$\varepsilon_3 = \lambda_3 = 7{,}301$$

It was then verified that the approximation made in this way is not too far off from the real curve. The error

$$E = (y_1 + y_2) - A$$

was therefore calculated.

In the three frequency intervals, the maximum error proved to be on the order of $2 \cdot 10^{-3}$ dB, and the approximation made can therefore be considered valid.

The attenuation difference Δy_2 of the parabolic component between the extremes and the center of the band has the following values in the three cases considered:

f_{o1}=20 MHz Δf_{o1}= 7 MHz $(\Delta y_2)_1 = -0{,}165$ dB/km
f_{o2}=40 MHz Δf_{o2}= 8 MHz $(\Delta y_2)_2 = -0{,}075$ dB/km
f_{o3}=70 MHz Δf_{o3}=10 MHz $(\Delta y_2)_3 = -0{,}050$ dB/km

It is therefore obvious that there is heightening of the sidebands. With increase of the frequency of the carrier, this heightening is reduced and the necessity of equalizing the cable thus diminishes.

FOOTNOTES

1. The most recent 60-MHz system is summarily described here, but there are also the previously developed 12-MHz and 18-MHz systems (Bibliography 5) that permit transmission of one or two TV channels, respectively.

2. By video signal-to-noise (S/N) ratio is meant the ratio, expressed in dB, between peak-peak amplitude of the image signal (nominal value: 0.7 V) and the effective value of the noise in the band between 10 kHz and 5 MHz. For measurement of the weighted signal-to-noise ratio, it is necessary to filter the noise with the weighting filter defined in Recommendation 567 of the IRCC [International Radiotelegraph Consultative Committee], which increases the S/N ratio by 7.4 dB in the case of flat noise (as in the 20-MHz

AM connections) and by 11.2 dB in the case of deemphasized triangular noise (as in the 40-MHz and 70-MHz FM modulators).

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11267
CSO: 5500/2353

CABLE LINKS WITHOUT REPEATERS DESCRIBED

Turin ELETTRONICA E TELECOMMUNICAZIONL in Italian May-Jun 82 p 121

[Text] The optical-fiber cables that will revolutionize telecommunications in our country will be of Italian design, technology and manufacture. They will make it possible to establish connections of about 100 km without repeaters.

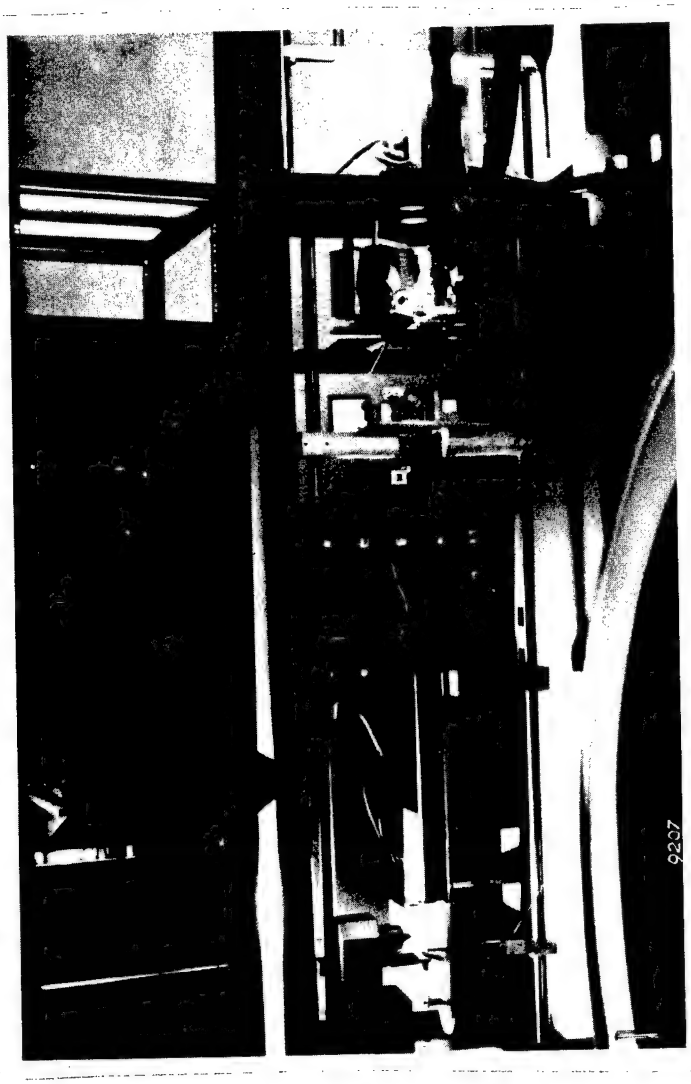
The CSELT (Telecommunications Research and Study Center), with the support of the SIP [Italian Telephone Co], the SIRTI [expansion unknown] and other entities of the IRI [Industrial Reconstruction Institute]-STET [Telephone Finance Corporation] group, has recently perfected a special technology for making optical fibers; it has been patented and its repeatability has been carefully verified.

The process is based essentially on pressurization of the quartz base (from which the fiber is obtained) by means of an appropriate fluid-dynamically activated device. This process, considerably automated, can be transferred to the industrial plane, and such fibers will in fact be produced in Italy by the FOS (Fibre Ottiche Sud) of Battipaglia, a company partly owned by the SIRIT (which already specializes in the field of installation of optical fibers) and Pirelli.

The optical fibers made in the CSELT present attenuation of 0.35 dB/km at the wavelength of 1.57 micro6, with numerical aperture of 0.2. The process perfected by the CSELT also makes it bandwidth such as to permit repetition pitches--i.e., without amplication and regeneration--considerably higher (three times or more) than those obtainable with index-gradient fibers.

With just one fiber like this, it will be possible, for example, to achieve 140-Mbit/s connections (corresponding to 2,000 simultaneous telephone conversations) with repetition pitches of around 100 km, as compared wit the 10 km achievable with the current commercial fibers and the 2 km permitted by copper coaxial cables.

The photograph shows the optical-fiber spinning installation installed in the CSELT.



11267
CSO: 5500/2353

OFFSHORE OIL INDUSTRY TO DEPEND INCREASINGLY ON SATELLITES

Oslo AFTENPOSTEN in Norwegian 13 Sep 82 p 29

[Article by Rolf L. Larsen]

[Text] Stavanger, 12 Sep--Operating companies on the Norwegian continental shelf will be able to completely integrate both mobile platforms and other contract vessels in their information and operation plans by using satellite communications. This is already being done now to some extent and such integration will be expanded steadily in the future.

In other instances too, such as in laying pipelines, there will be a need for a continuous transmission of information, something that could be made considerably more efficient with the use of satellite communications, said director Sivert Overaas of the Norwegian Shipowners' Association/Norwegian Offshore Society during a seminar for maritime satellite communications for drilling and contract vessels which opened Wednesday in Stavanger.

The seminar was arranged by the Telecommunications Directorate and has attracted around 80 participants from telecommunications authorities, shipping firms and oil companies, among others. The background for the seminar is that two important events have occurred this year that are expected to have far-reaching consequences for communications between mobile and shore units. The international maritime satellite organization, INMARSAT, started its activities on 1 February of this year and on 22 February the Eik coastal ground station in Rogaland was opened. This is the first maritime ground station in Europe.

Director Overaas said that the main advantage of satellite communication equipment for rig owners is that it gives them reliable contact with the rigs no matter where in the world they are operating within the INMARSAT coverage area between 70 degrees south and 70 degrees north latitude. The big benefits obtained from the possibility of keeping a constant eye on operations will be of great importance for supervising and planning operations and this will have a greater impact on large organizations than on smaller ones. Thus for drilling rigs, this will primarily interest the operating companies. This kind of follow-up and integration into a larger information and control system could be made even more efficient with data

transmission. Ships searching for oil have a special need to transmit large quantities of data. Satellite terminals for shipboard use can now be equipped for rapid data transmission. There is a great need to transmit data from seismic studies in the case of vessels that are searching for oil, said Overaas.

He stressed that if the satellite terminals work well on ships that have a lot of motion from rolling and starting up, there should be no problems onboard a rig which is subject to much less motion. The biggest advantages of satellite communications are reliable contacts and the possibility of transmitting data. This opens up possibilities for an integrated information and operating system that might be organized within an individual shipping firm, he said.

Overaas pointed out that as of 1 July of this year a total of 311 satellite terminals linked to INMARSAT were installed on ships and platforms. Of a total of 113 ground stations on platforms, 10 are Norwegian. This means that more than 30 percent of Norwegian rigs and platforms have such installations. Compared with installations on ships, this is quite good--more than three times as many, figured in percentages.

6578
CSO: 5500/2362

BRIEFS

FOREIGN DIRECT-DIALING INCREASE--Starting on 1 October, it will become even easier to get in touch with the rest of the world by telephone. On that date the Telecommunications Agency will inaugurate direct dialing to 37 new countries and sometime next year, direct dialing will be extended to another 50 countries. All European countries except Albania will then be connected to the direct-dialing network, even though the Soviet Union has shut down public direct dialing to Europe for the indefinite future. The new direct-dialing opportunities do not involve new investments for the Telecommunications Agency because the equipment that is needed is already in place. And in general there is little traffic on the new direct-dialing lines. The Telecommunications Agency revealed that in all of last year there were only around 6,000 hours of calls to these new areas compared to roughly 1 1/2 million hours to Europe in the same period. With this expansion of direct-dialing opportunities, it is estimated that 97 percent of the telephone traffic out of Norway can be dialled directly. When the new connections are hooked up next year 160 countries in all will be accessible by direct dialing from Norway. [Text] [Oslo AFTENPOSTEN in Norwegian 27 Sep 82 p 4] 6578

PHONE NET PAGING SYSTEM--In the fall of 1984, the Telecommunications Agency will introduce public personal paging. This new service will make it possible to alert a person equipped with a personal pager by calling the recipient's number from a regular telephone. The new personal pagers will be pocket-sized and will cost between 1,000 and 3,000 kroner. Sales will go through regular radio suppliers and could occur in competition with private suppliers. The service can only be used in sections of the country that have radio coverage. The Telecommunications Agency intends to start off by constructing 75 radio transmitters that will cover cities and heavily populated areas. A possible expansion will be evaluated later on. Complete nationwide coverage would require a great many new transmitters. A market survey showed that there is great interest in this new service. Personal paging will be an important supplement to telephone service since a subscriber can be alerted even if he cannot be reached by telephone. [Text] [Oslo AFTENPOSTEN in Norwegian 27 Sep 82 p 4] 6578

CSO: 5500/2502

IMPACT OF COMING SATELLITE TELEVISION WEIGHED BY EXPERTS

Stockholm 7 DAGAR in Swedish 30 Jul 82 pp 22-25

[Article by Bill Hancock: "Behind the TV Satellites--a Billion Kronor Industry in the Starting Blocks"].

[Text] In a few years satellite TV will be big business in Sweden. The Telecommunications Administration and private installers are now in the starting blocks for the fight for the ten billion which the project is estimated at for the first year.

In April--May, 1985, in less than 1000 days, the Swedish people will sit in front of its 3.4 million TV sets and watch the first transmission from West Germany's TV satellite. It will be detective stories, soccer matches and long films every day. In the summer of 1985, gangster-imitating Swedish small children will no longer cry "hands up," but instead they will say "Hande hoch." Only a few months later we will also be able to punch in on the remote control box the French TV satellite with more entertainment. However, this scenario which is ideal from the point of view of the dealer in parabolic antennas will be realized only in part. After conversations with the Telecommunications Administration, the parabolic antenna industry and the TV-radio equipment trade, 7DAGAR can make a qualified guess. During the spring and summer of 1985 only 1.3 million of our TV sets will be connected to some kind of satellite TV receiver.

Then it will take an additional, approximately 5 years before the rest of the Swedish people, or in any case the majority (except in sparsely populated areas in the north) can see the satellite transmissions.

How much will it cost to participate in the big satellite-TV premiere in the spring/summer of 1985 (the exact point in time is still uncertain)?

"The premiere ticket" will cost between 1000 and 5000 kronor per TV household depending upon the where and how one lives. North of the line Ostersund-Gavle the satellite transmissions will be poor and difficult to receive.

Bureaucrats

For the Swedish people the entire bill for satellite TV will be approximately 10 billion kronor over a 5--10 year period, during which the entire cable-TV network will be developed and the satellite TV receivers (a better word than parabolic antenna) installed. For comparison it should be mentioned that the Swedes this year are buying approximately 285,000 TV sets for 1 billion kronor. 1985-88 will be really big development years for the satellite-TV receiver systems. A new statistical "hump."

The money for the cable-TV network, etc., is not at all wasted: approximately 1/2 or approximately 5 billion will go for wages for 2,500-3,000 installers, technicians, dealers, bureaucrats, etc.

A rough 1 billion of the 10 will be for cable costs. It is difficult to make a calculation when today we do not know when the telecommunications administration will get started with the development of the cable TV network. Unfortunately we are in the transition from coaxial to optical technology, which means that instead of copper cables we are starting to use cables of glass fibers ("optical" fibers). The technicians would probably have preferred waiting 5 years with the premiere of satellite TV. Then they would have had time to clarify the new technology.

For Sieverts Kabelverk (LME) and IKO-kabel in Grimsas (American ITT) satellite TV comes at a convenient time since the demand for cables has been dropping for a longer period of time. Sieverts, for instance, does not have to make any investment in order to deliver coaxial cable to the Telecommunications Administration's cable TV network. They have a production line--which now stands still--for that purpose in Hudiksvall.

Tug-of-War

We wrote: "1,000-5,000 kronor for the satellite TV premiere ticket depending on where one lives." The "predominant" reason for the uneven pricing is that Sweden's people, politicians and parliament do not consider satellite receivers to be necessary (whether it involves large central installations under the management of the Telecommunications Administration or small parabolic antennas from the wall of a house). Each one must therefore pay what it actually costs to get the satellite pictures on the screen. The 10 billion will not be taken out through taxes.

"Interest is Already Great Among Property Owners"

An enormous tug-of-war for the TV households between the Telecommunications Administration and private installers of satellite receivers is brewing. 7DAGAR can give a horse tip: The Telecommunications Administration will in the long run win the marathon race for the TV households. But the private sector gets the first rounds up to 1985--86 and will for a while appear to be the winner.

"When it breaks out" is the expression which Malte Ellstrom, head of the Telecommunication Administration's Department for Video Technology, uses when

he talks about the time when the market is truly open for satellite TV receivers. The time will be sometime in 1984.

"We don't have our marketing strategy completely clear yet. We are in the information collection stage," says product manager Henrik Zeinow in Gylling-Foretagen, a big future importer of parabolic antennas, amplifiers, etc.

Starting Blocks

Already in the 1970's Luxor in Motala received a contract from the Nordic Council to take a look at the costs of Nordstat receivers. Engineer Per-Olof Backman has since been directing the company's receiver project. Luxor is the only Swedish producer of parabolic antennas and has left the starting block a long time ago and is on its way towards the goal: a market share in 1985 of 60--70 percent for "the people's receiver" for satellite TV, a parabolic antenna with a screen with a diameter of 90 cm. It will be able to receive both the German and the French satellite programs in 1985 in one-half of Sweden (up to the Gavle-Ostersund line).

As is well known, Luxor went down a few years ago and is now owned by the government. "The parabolic antenna is Luxor's straw," it is said in the industry. But it is a good straw. Luxor recently received an American order for 30 million kronor for satellite receivers (much more than 10,000 pieces). There has been applause when a Swedish company gets to deliver satellite receivers to the United States (the Americans naturally make the parabola themselves; it is only the electronics that is delivered from Luxor).

The manager of Luxor's Consumer Electronics, Owe Candow, says: "With the present technology it requires a labor force of 200 persons in order to produce 125,000 parabolic antennas annually, which corresponds to our market share for TV sets. It is our minimum goal."

Luxor does not have the capability to stamp the screens for the antennas themselves. They have already discussed sub-deliveries from Volvo, Granges and other sheet metal stamping companies. Parabolic antennas mean more work in Sweden.

Luxor's marketing is already in full swing. They are selling in the radio-TV trade and are tempting with a "satellite profile" for those who for approximately 30,000 kronor get hold of a parabolic antenna which picks up the Russian satellite Horizont.

Circuit Card

"Three years from the beginning of 1985 at least one-half of the 2.2 million individual TV households in Sweden, Norway and Denmark will have bought a 90-cm parabolic antenna which picks up the German transmissions," says Per-Olof Backman. "This is my evaluation after 6 years in the field."

In 1988 1.2--1.3 million "people's parabolas" will "decorate" Scandinavian houses and row houses (in Finland the situation is different for several reasons). A good one-half or approximately 500,000 of them can be found in

Sweden. Luxor's share 30--60 percent. But there are tough competitors: Philips, the West German Fuba, etc.) Bill for the Swedes: approximately 3 billion.

Per-Olof Backman can already today give the prices per household: approximately 3,500 kronor for the parabolic antenna including screen, microwave transposed transmission line (the electronics of the actual antenna) and the part inside the house (the actual receiver, which is built into new Luxor sets). In addition comes the installation: approximately 1000 kronor. For the French satellite it is necessary to have a circuit card which can manage the different French color system. Price approximately 500 kronor. A total of approximately 5000 kronor for the "people's parabola."

In the Telecommunications Administration it is estimated that approximately 2 million TV households in Sweden are today connected to various central antenna systems. The number of connected TV households per system varies between 20 and 4,000. Nobody knows exactly how many systems there are. The industry guesses at approximately 60,000.

Will these 2 million TV households in approximately 60,000 central antenna systems not be allowed to participate in the satellite TV premiere? How many will be allowed to participate? Who will supply the 2 million TV households with satellite pictures? The Telecommunications Administration via cable TV or private installers through modified antenna installations equipped with parabolic antennas (i.e., satellite receivers)?

"Basic Network"

This spring the Telecommunications Administration issued a report which outlined a cable TV network with approximately 250 central antenna installations, which should cover all densely populated areas with more than 4000 inhabitants and give satellite pictures plus the Swedish TV 1 and TV 2 and various other things to approximately 2.3 million TV households. The existing 60,000 central antenna systems will be converted to 250 very large installations (for instance, only one for all of Stockholm). Smaller systems will be left in sparsely populated areas and in approximately 1400 densely populated areas.

The Telecommunications Administration will develop a "Basic Network" (Cable TV Network) which will be able to deliver 25--30 TV channels and just as many extra sound channels to all properties in densely populated areas where it is profitable to sell TV channels via the network.

The Telecommunications Administration will not directly take over existing central antenna installations. They are not suitable for satellite TV reception since with few exceptions they are built for receiving only two channels, TV 1 and TV 2. All of Sweden's central antenna systems must be equipped with new amplifiers, which cost approximately 1000 kronor per subscriber (in round figures) or a total of approximately 2 billion kronor.

If these 2 billion are added to the 2.3 billion which the Telecommunication Administration's Basic Network (Cable TV network) costs, then one gets a total

of close to 4.5 billion. This is how much it costs to equip 2 million TV households (connected to central antennas) with satellite TV receivers (plus some 20 other channels). It will be approximately 2,250 kronor per household. But when can it happen?

Complicated

At the Telecommunications Administration they say that in 5--8 years after one has "got going." But when can one get going?

Now comes the complicated part of the story. Department Manager Lars O. Aronsson is cable TV project director at the Telecommunications Administration. He says: "The cable TV is a multibillion investment which must be paid with the customer's money. But today we have nothing to 'sell' to the customer except the two normal TV channels and the radio programs. The official attitude of the Telecommunications Administration is that the radio law today prevents us from distributing programs which are sent, for instance, by the Russian satellite Horizont, or by the OTS Communications satellite which is owned by the European Telecommunications Administration.

It is the so-called round radio monopoly which is haunting us. The Telecommunications Administration cannot today go out and offer property owners and housing corporations central antenna systems which are built for satellite TV reception--as long as there are no "allowed" satellite TV transmissions on the market. They will not come before the summer of 1985.

On the other hand, the private installers have no reservations.

"The private installation companies do not believe that the radio law prevents them from installing central antenna systems which even take in satellite signals," says Henrik Zeinow. from Gyllingforetagen. "There is already great interest among the property owners. We could start selling already tomorrow. When we have our market strategy clear, we find the customers by means of directed advertising. We will be in operation already next year. We have a hard battle with the Telecommunications Administration ahead of us."

Large Systems

The private installers are planning to tie existing central antenna systems together into large systems which cover at least complete blocks in the cities. There will probably be new special companies for this new field. So far mainly electrical installers have built central antenna installations. The quality is very uneven.

Of the now existing approximately 60,000 central antenna systems, after "the tying together" possibly 10 thousand may be left. What does it cost to rebuild a central antenna system to also cover satellite TV receivers? We will take a concrete example: A property at Ostermalm in Stockholm with 50 TV households is converted to receive in addition to the Swedish TV and radio programs even the German and French satellite programs. Henrik Zeinow outlines the following calculation:

The receiver part on the roof	approximately	30,000 kronor
Main amplifier	approximately	6,500 kronor
Other material	approximately	7,500 kronor
Wages	approximately	10,000 kronor
Total	approximately	54,000 kronor

This is naturally a highly preliminary calculation in which the fact that series production will reduce the prices of the products is taken into consideration. It is thus not today's price. The result for the TV household will be approximately 1000 kronor per household. It will be much cheaper than the "people's parabola," but it will be even cheaper if the system is larger: the receiver part and the main amplifier do not become more expensive even if the system becomes 10 times as large.

What can the Telecommunications Administration come up with against this before the satellite TV premiere in the summer of 1985? A promise that within 5--8 years it will be able to deliver 25--30 cable TV channels with high quality to approximately one-half of the country's TV households?

"In the summer of 1985 we will have the cable TV network laid to properties with close to 1 million TV subscribers," Lars O. Aronsson tells 7DAGAR.

We cannot tell how many TV subscribers will be connected to the Telecommunication Administration's basic network when the German satellite premiere takes place. The network is being developed where there are dense concentrations of TV subscribers, in the central parts of large cities and in their larger suburbs.

The Telecommunications Administration with 43,000 employees is not inactive. In Lund it is building a test center antenna installation for the entire municipality with a 12-meter parabolic antenna, which will pick up West and East German TV programs. They will together with TV 1, TV 2, and the radio programs be disseminated to all residents of Lund. The start will be in 1984. In Kortedala in Goteborg the administration is building a central antenna installation for 4,000 subscribers, which will also offer Norwegian and Danish TV. At Skarpnack in Stockholm they are testing coaxial and optical technology simultaneously in one and the same system.

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L. M. ERICSSON INTRODUCES PHONE WITH VOICE-ACTIVATED DIAL

Copenhagen BERLINGSKE TIDENDE in Danish 27 Sep 82 Sect II p 6

[Article by Christer Isaksson]

[Text] It ought to be said now: Technology is wonderful. The newest technical invention has been shown in Stockholm: a telephone with which one can talk, which takes orders and dials numbers on its own.

"Call Sven Svensson," I may tell my telephone in the not too distant future. And without my touching the dial or push buttons or at all lifting the receiver, I will hear Sven Svensson answer at the other end.

The invention has just been presented in Stockholm. It is L. M. Ericsson's Telecommunications Materials, Inc., which has developed the phone. The idea is for it to become a hit in the international market.

"I believe that our system is the first one in the world," said Jan Løvberg, marketing chief, asking his telephone to call a certain Carl Sundman. The telephone responded, and soon Carl Sundman's voice was heard over the loudspeaker of the phone.

The gadget making it possible to give orders to the telphone is called a "voice-activated dial" and is coupled to L.M. Ericsson's tested telephone system. The Technical University at Stockholm has helped develop this marvellous piece of equipment.

The clever thing about the new telephone is that it obviates the need to keep check of a lot of telephone numbers, to look numbers up in telephone directories or to push buttons to get a connection.

At first, the system will be used in enterprises and telephone stations. The necessary telephone numbers are programmed for each individual telephone which stores them in a memory. Today, each telephone is capable of handling 3,500 numbers. If a large switchboard is built, the method may be used on a larger scale and in connection with ordinary telephones.

Once all the necessary numbers have been stored, one need only ask for the person to whom one wants to speak, and the telephone will arrange the connection.

It is a time-saving device, say the inventors of their new product. One may even go so far as to program a certain person by the name of Karlsson whose name one always forgets.

"What is now the name of that particular person?" one asks the telephone.

"Karlsson," Karlsson answers at the other end of the line. The telephone has found the person in question.

Now one would probably believe that such a telephone might give rise to embarrassing situations. If one happens to talk about Sven Svensson, the telephone will probably respond and call him. But that is not possible since one has got to push a button when giving the order. One problem is that the voice-activated dial makes it impossible for anybody else to use my telephone. It is so well disciplined that it will respond to my voice only and will ignore completely the voices of other people.

Technologists have their problems working with wonderful technology.

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ERICSSON CONTINUES TO INCREASE AXE PHONE EXCHANGES

Stockholm SVENSKA DAGBLADET in Swedish 29 July 82 p 16

[Article by Johan Myrsten: "The Telephone Exchange which Became Record Seller. The Billions are Rolling In."

[Text] The Electronic Telephone Exchange AXE has become one of Sweden's export products. The Ericsson Company's total AXE orders have now reached more than 10 billion kronor. In addition come additional billions in follow-up orders for cables, network installations, construction contracts, etc.

So far 38 countries have placed larger or smaller orders for the AXE system, and it might be more. Recently Ericsson passed a desired dream limit when the number of ordered and installed AXE-connected telephone lines climbed above the 5 million point. (The capacity in telephone stations is normally measured in how many lines they can serve). At the most a couple of the foreign competitors have sold more lines in electronic systems.

Follow-Up Orders

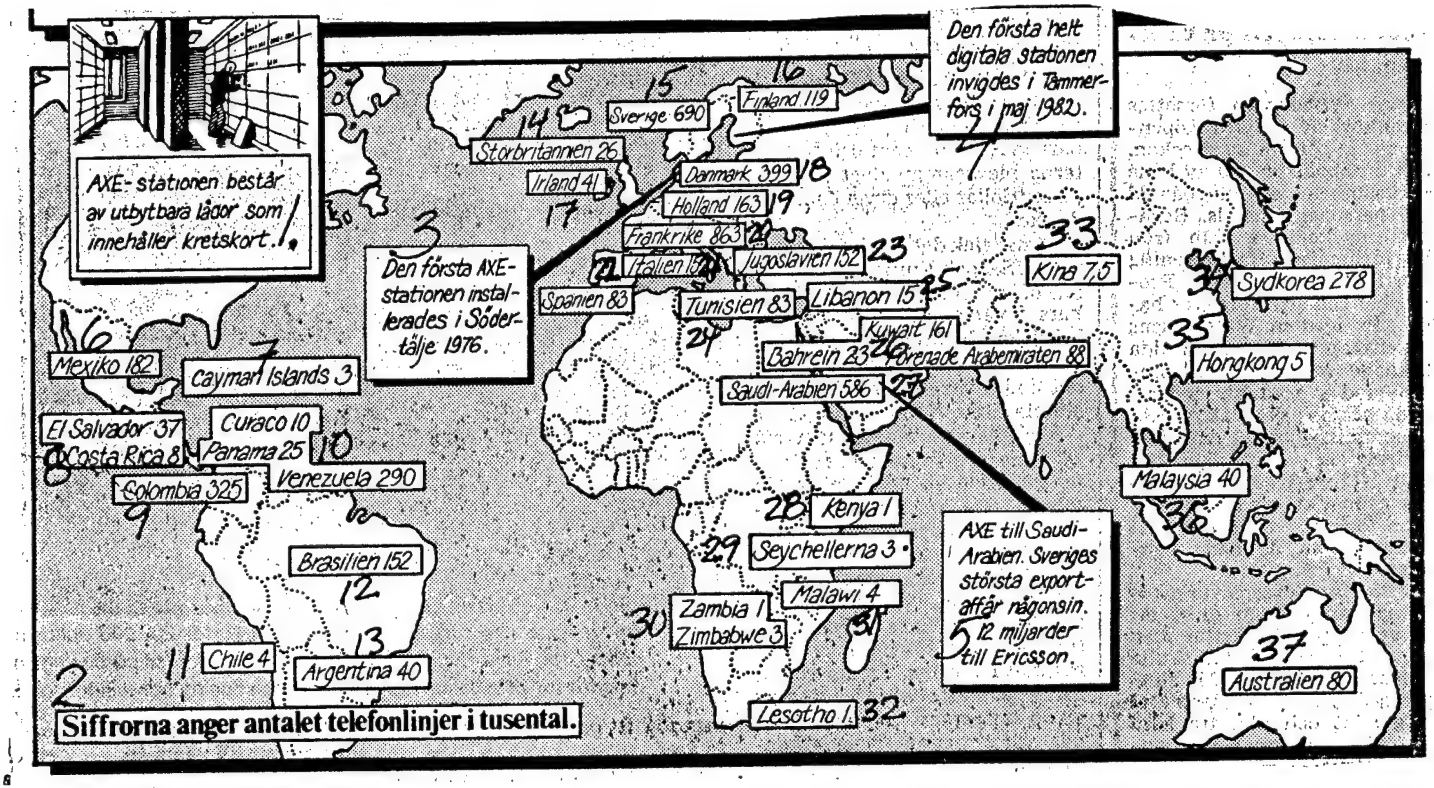
This is only the top of the iceberg. Those who buy the AXE system also need a series of other products and services, which frequently are ordered through the same supplier. This is clear from the orders from Saudi Arabia--Sweden's largest export business ever.

There the total amount of the orders from Ericsson and the partner Philips after four add-on contracts has increased to 24 billion kronor, of which a good 20 have already been invoiced. Only a smaller part pertains to the AXE stations themselves. Most of it goes to network investments (cable, digging cable ditches, etc.), which to a great extent is handled by subcontractors. The orders also include telephone sets, mobile telephones, etc.

Ericsson and Philips share the contract amount roughly equally. One-half is booked with the two companies' common subsidiary in Saudi Arabia, Philips-Ericsson Joint Venture.

Of Ericsson's 12 contracted billions, 6 result in export from Sweden. Of this approximately 4.5 billion kronor pertains to material and the rest to services.

The Biggest Buyers of AXE Stations



As of May this year, Ericsson has sold close to 500 AXE stations with a total capacity of 5,014,000 lines. Of these 168 stations were installed with 1,516,000 lines. (The Ericsson Company has a "conservative" estimate for the number of lines ordered and does not include expected orders not contracted for). Source: Ericsson.

Key to the Figure:

1. The AXE station consists of exchangeable boxes which contain certain cards.
2. The figures indicate the number of telephone lines in thousands.
3. The first AXE station was installed in Sodertalje in 1976.
4. The first completely digital station was dedicated in Tammerfors in May of 1982.
5. AXE to Saudi Arabia. Sweden's largest export business ever. Twelve billion to Ericsson.
6. Mexico 182.
7. Cayman Islands 3
8. El Salvador 37, Costa Rica 8
9. Colombia 325
10. Curaco 10, Panama 25, Venezuela 290
11. Chile 4
12. Brazil 152
13. Argentina 40

14. Great Britain 26
15. Sweden 690
16. Finland 119
17. Ireland 41
18. Denmark 399
19. Holland 163
20. France 863
21. Italy 15
22. Spain 83
23. Yugoslavia 152
24. Tunisia 83
25. Lebanon 15
26. Kuwait 161, Bahrein 23, United Arab Emirates 88
27. Saudi Arabia 586
28. Kenya 1
29. The Seychelles 3
30. Zambia 1, Zimbabwe 3
31. Malawi 4
32. Losotho 1
33. China 7.5
34. South Korea 278
35. Hong Kong 5
36. Malaysia 40
37. Australia 80

"A Lift"

"The Saudi order gave us a lift," says director Knut Albertsson, who is head of for Ericsson's marketing of telephone stations.

Through the Saudi order, Ericsson got an enormous reference project. It also contributed to a higher production volume at the home level.

Europe's Biggest

In spite of the giant order from Saudi Arabia, it is Europe which so far still is the biggest market for the AXE system, with one half of all installed and ordered lines. In Europe Scandinavia (1.2 million lines) and France (863 thousand lines) have so far been the biggest customers. For comparison it can be mentioned that the number of installed and ordered lines in Saudi Arabia so far is 586 thousand--but they have resulted in considerably larger follow-up orders than the European purchases.

"We must thank the earlier coordinate selector systems for the position we are in now," says Knut Albertsson.

The old electromechanical coordinate selector line commutators were sold in a series of countries from the 1950's to the beginning of the 1970's. Then came the entry of electronics in the world of telecommunications, and now the

telecommunications administrations in practically all countries have managed to issue calls for bids for electronic systems.

Keep Customers

"Our philosophy was primarily to try to keep traditional LM customers when they were going to switch over to a new technology," says Knut Albertsson.

Of the 20 biggest "traditional" LM customers, approximately 15 have chosen AXE. A couple have not yet decided on the new technology (including Norway), and in a couple of countries Ericsson has lost. This is true for Italy, where Ericsson has only sold individual stations, and Egypt where Ericsson was beaten by a competitor who was able to offer better loans. But Knut Albertsson believes that new opportunities may crop up later on in Egypt.

In addition, Ericsson has won new customers, e.g., in the Gulf states of the Persian Gulf and in South Korea.

The situation is now as follows, market by market:

In **Europe** Ericsson sees Holland, Ireland and Spain as important customers, which can be expected to order more than they have already done. A license agreement exists with Yugoslavia.

On the other hand in France the company sees "no continuation" after the big deliveries which were ordered and which were mostly produced locally on license. There Ericsson no longer has any property interest left, but it has been taken over by the French Thomson.

In Great Britain Ericsson made an attempt with an offer earlier this year but lost out. The project was to increase the capacity in 50,000 existing telephone lines. The British considered it too expensive to do that with a completely new system such as AXE. In addition, it would have been a strike against the British counterpart, System X.

"So England is probably only a specialized market for us, primarily for international long-distance traffic," Knut Albertsson comments.

Norway Unclear

In Scandinavia Norway is marked with a question mark. The Norwegians have not yet decided how many will be invited to submit the first bids on electronic telephone stations. The choice is only between ITT's Norwegian factory and partly Ericsson-owned (25 percent) Elektrisk Bureau or a broader group of foreign companies.

In **Latin America**, a traditional LM market, Mexico, Brazil, Columbia and Venezuela have chosen AXE as the system for the future--even though AXE will not become the only system in all these countries.

Australia is "an incredibly important customer" according to Knut Albertsson. After a slow start with small orders the transition to electronic stations is expected to speed up from 1985 on. From then on the rate of development is estimated at approximately 250,000 lines annually.

In **Asia** contract negotiations are being carried out with Malasia, which has given Ericsson a so-called letter of intent for 100,000 lines annually for 10 years.

South Korea is a new, big customer which is being highly evaluated by Ericsson since it involves transit stations (for long-distance traffic) rather than stations for local traffic. Ericsson certainly hopes they will also get to deliver local stations, but that market is now being dominated by the American companies ITT and Western Electric.

In Indonesia Ericsson is participating in a big competitive bidding where the two main competitors are ITT and Siemens.

Refrained from Bidding

Ericsson considers Singapore and Hong Kong to be interesting markets, but the Japanese companies are dominating there. In India Ericsson chose not to bid on a big tender recently, and the question is what will happen there later on.

In **Africa** there are several smaller customers. Several countries in northern and eastern Africa are now starting to become interested in telecommunciations investments since they have received better credit possibilities. The biggest customer so far is Tunisia, which inaugurates its first AXE station this fall.

In the **Persian Gulf** the two biggest buyers so far are Kuwait and the United Arab Emirates. The oil-producing countries are highly appreciated as customers by Ericsson since they do not require local production as so many others do. In addition, they most frequently pay in cash upon delivery and do not require any credit.

Finally, in the **United States** Ericsson has come close to two possible breakthroughs. One pertains to AXE stations for one US long-distance operating company, MCI. The other is delivering mobile telephone systems from SRA and AXE stations to them.

Facts

Those who ask "AXE--what is that?" could hardly cope with an exhaustive reply.

Briefly AXE is a telephone exchange which consists completely of electronic parts. Instead of the electrically controlled mechanical parts in last generation's exchanges, AXE consists of a number of "cabinets" with "drawers" containing electronic circuit cards. These cards can be replaced as they become outdated or unnecessary--something which is considered to be a refinement which extends the life of the framework in the system. The

electronics takes considerably less space than the old electromechanical parts.

AXE is thus in principle a fast computer filled with so-called processors, which control telephone calls--whether it takes place in analog (a continuous transmission of the frequency changes in the speech signals) or digital (a discontinuous transmission of coded speech) form.

Seven expensive data systems and large quantities of programs are required to control everything which takes place in the circuit cards. This is the system which is the foundation for AXE, and it has required a large part of the long development work. This work was carried out in the development company Ellemtel, which is owned jointly by (LM) Ericsson and the Telecommunications Administration.

AXE is thus not only an Ericsson product, although it may frequently seem that way.

Two Steps Ahead of the Competitors

Ericsson's AXE system has obtained two important advantages in the battle for the telecommunications contract in the world market:

--a complete range of products

--a production which has reached an industrial scale

This is what Knut Albertsson believes, who is Ericsson's manager for telephone exchange marketing.

The reason for AXE's export progress is certainly an advanced technology, but in addition with time two new factors have arrived.

"Complete Coverage"

By "complete range of products" Albertsson means that Ericsson now can sell local stations (both for analog as well as for digital telecommunications traffic), stations for automatical long-distance traffic inside a country, as well as stations for international long-distance traffic. In addition, LM has started selling mobile telephone systems (built around AXE exchanges) with promising results. Two new "ministations" for sparsely populated countrysides are under development, one for up to 10,000 lines and a mobile exchange for 128--2,000 lines.

"By having all types of stations we feel we are a step ahead," says Knut Albertsson.

"But it has taken us all the time from the opening of the first AXE station in Sodertalje in 1976 up to this year in order to cover the entire scale."

When the first completely digital AXE station was inaugurated in Tammerfors in May 26 of this year, this "complete coverage" was symbolically achieved.

Main Competitors

Among the competitors there are, according to Knut Albertsson, three companies which have just as broad an assortment as Ericsson: the American Western Electric, the Canadian Northern Telecom and the Japanese Nippon Electric. But none of the more traditional competitors--the West German Siemens, the American ITT, the French Thomson and CIT-Alcatel, the Dutch Philips, etc.--have come as far as this, according to Albertsson.

The other new competitive advantage--production on an industrial scale--is a consequence of the fact that Ericsson has received such large orders. In this way Ericsson can arrange a flow in the production and manage to reduce the production costs.

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